

# COUNTY EMPLOYEES' RETIREMENT FUND

## COMPREHENSIVE ANNUAL FINANCIAL REPORT FISCAL YEAR ENDED DECEMBER 31, 2018



*Helping you build a brighter tomorrow.*

**Sarah Maxwell  
Executive Director**

**Kelly Schwartze, CPA  
Deputy Director**

**County Employees' Retirement Fund  
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Jefferson City, MO 65101  
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# INTRODUCTORY SECTION





**COUNTY EMPLOYEES'  
RETIREMENT FUND**

June 6, 2019

To the Board of Directors  
County Employees' Retirement Fund  
Jefferson City, MO 65101

We are pleased to provide this Comprehensive Annual Financial Report (CAFR) of the County Employees' Retirement Fund (CERF), for the fiscal year ended December 31, 2018. Responsibility for both the accuracy of the data and the completeness and fairness of the presentation in this CAFR rests with the management of CERF. To the best of management's knowledge and belief, the enclosed data is accurate in all material respects and is reported in a manner designed to present fairly the financial position and results of operations of CERF.

### **Background Information**

CERF was established by an act of the Missouri General Assembly effective August 28, 1994. CERF is a mandatory cost-sharing multiple employer retirement system for each county in the state of Missouri, except any city not within a county and counties of the first classification with a charter form of government, other than any county adopting a charter form of government after January 1, 2008. CERF covers county elective or appointive officers or employees whose position requires the actual performance of duties not less than 1,000 hours per year and does not cover circuit clerks, deputy circuit clerks, county prosecuting attorneys, and county sheriffs. CERF is a defined benefit plan providing retirement and death benefits to its members. Retirement benefits vest after 8 years of creditable service.

As of year-end 2018, CERF served almost 20,000 members, including approximately 5,300 retirees and beneficiaries.

### **Mission Statement**

CERF's mission statement is to provide an accountable, financially sound system which promotes retirement security and rewards members with comprehensive benefits.

### **Accounting System and Reports**

Management of CERF is responsible for establishing and maintaining internal controls designed to ensure that CERF's assets are protected from loss, theft, or misuse. Responsibility for the accuracy, completeness, and fair presentation of information, and all disclosures in this CAFR and in CERF's records, rests with CERF's management. Williams-Keepers, LLC, a certified public accounting firm, has audited the financial statements and related disclosures. The financial statement audit provides reasonable assurance that CERF's financial statements are presented in conformity with U.S. generally accepted accounting principles and are free from material misstatements. The internal controls are designed to provide reasonable, but not absolute, assurance that these objectives are met. The concept of reasonable assurance recognizes that the cost of a control should not exceed the benefits likely to be derived, and that the assessment of costs and benefits requires estimates and judgments by management.

This report has been prepared in accordance with generally accepted accounting principles (GAAP) as promulgated by the Governmental Accounting Standards Board (GASB). GAAP requires that management provide a narrative introduction, overview, and analysis to accompany the basic financial statements in the form of management's discussion and analysis (MD&A). This letter of transmittal is designed to complement the MD&A and should be read in conjunction with it. CERF's MD&A can be found immediately following the independent auditors' report.

The Government Finance Officers Association of the United States and Canada (GFOA) awarded a Certificate of Achievement for Excellence in Financial Reporting to CERF for its CAFR for the fiscal year ended December 31, 2017. This was the second year CERF had applied to receive this prestigious award for its annual report. The Certificate of Achievement is the highest form of recognition for excellence in state and local government financial reporting. To be awarded a Certificate of Achievement, a government must publish an easily readable and efficiently organized CAFR. This report must satisfy both generally accepted accounting principles and applicable legal and GFOA reporting requirements.

A Certificate of Achievement is valid for a period of one year. We believe this report continues to conform to the Certificate of Achievement Program requirements and we are submitting it to the GFOA to determine its eligibility for another certificate.

## **Fiscal Year 2018 Highlights**

Fiscal highlights and major initiatives during 2018 were as follows:

- Due to positive feedback received during the November 2017 pre-retirement seminar, 5 regional pre-retirement seminars were held during 2018.
- CERF continued to focus on member outreach through newsletters, retiree spotlights, and county visits. CERF staff visited 77 counties, attended 8 benefit fairs/new employee orientations, and attended or presented at 8 county association conferences.
- The CERF website was redesigned in 2018 to make it more user friendly for both participants and employers.
- In November 2018, CERF staff successfully implemented a major upgrade to the CARS benefit payment system.
- 2018 was the first year of new fee collections as a result of Senate Bill 62, resulting in approximately \$7,000,000 of additional revenue.

## **Funded Status**

The funded status measures the progress of accumulating the funds necessary to meet future obligations. As of December 31, 2018, the actuarial funded ratio of CERF decreased from 72.1% to 65.9%, primarily as a result of a poor investment market during 2018. A detailed discussion of funding is provided in the Actuarial Section of this report.

## **Investments**

CERF's total pension return was (3.21)% (net of fees), less than the expected rate of return of 7.75%. In addition, over long periods of time, CERF continues to produce investment returns that exceed CERF's objective. The annualized investment return for CERF over the last ten years is 9.19%, and is 8.36% since inception.

A complete discussion of CERF's investment returns, activities, asset allocation strategy, and policies governing those activities can be found in the Investment Section.

## Professional Services

Professional consultants are selected by the Board of Directors to perform professional services that are essential to the effective and efficient operation of CERF. An opinion of the certified public accountant and the actuary are included in this report. The consultants appointed by the Board are listed on page 4 of this report.

## Acknowledgments

This report, prepared by CERF's executive director and staff, is intended to provide comprehensive and reliable information about CERF, to demonstrate compliance with legal provisions, and to allow for the evaluation of responsible stewardship of CERF's funds.

This report is being provided electronically to all participant counties of the system. These offices form the link between CERF and its membership, and their cooperation contributes significantly to the success of CERF. We hope all readers of this report find it informative and useful. An electronic version of this report is available on CERF's website at [www.mocerf.org](http://www.mocerf.org).

We express our gratitude to the members of the Board, the staff, the consultants, and the many people who have worked so diligently to assure the continued successful operation of CERF.

Respectfully submitted,



Sarah Maxwell  
Executive Director



Kelly Schwartze, CPA  
Deputy Director



Government Finance Officers Association

# **Certificate of Achievement for Excellence in Financial Reporting**

Presented to

**County Employees' Retirement Fund  
Missouri**

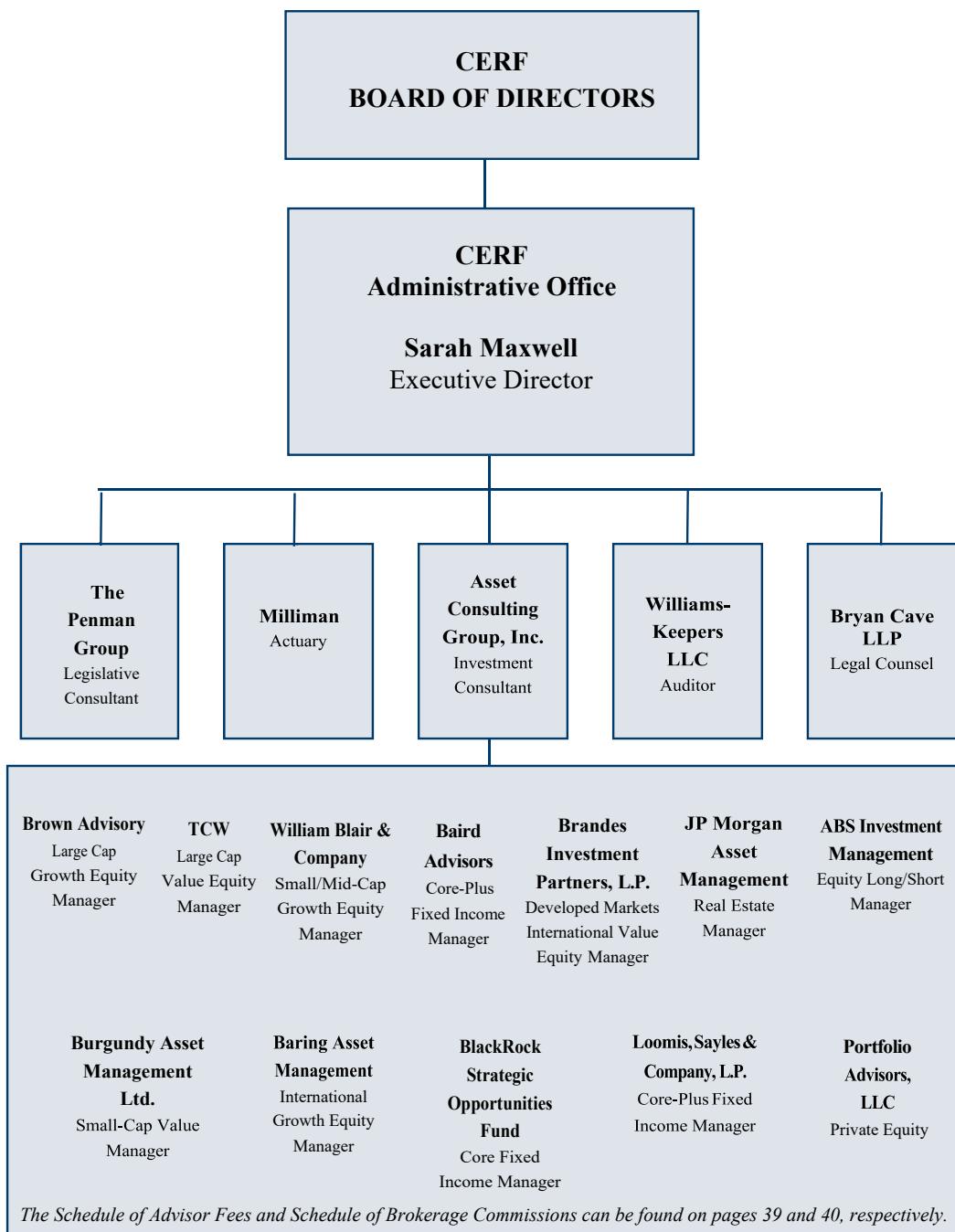
For its Comprehensive Annual  
Financial Report  
for the Fiscal Year Ended

**December 31, 2017**

*Christopher P. Monill*

Executive Director/CEO

# ADMINISTRATIVE STRUCTURE



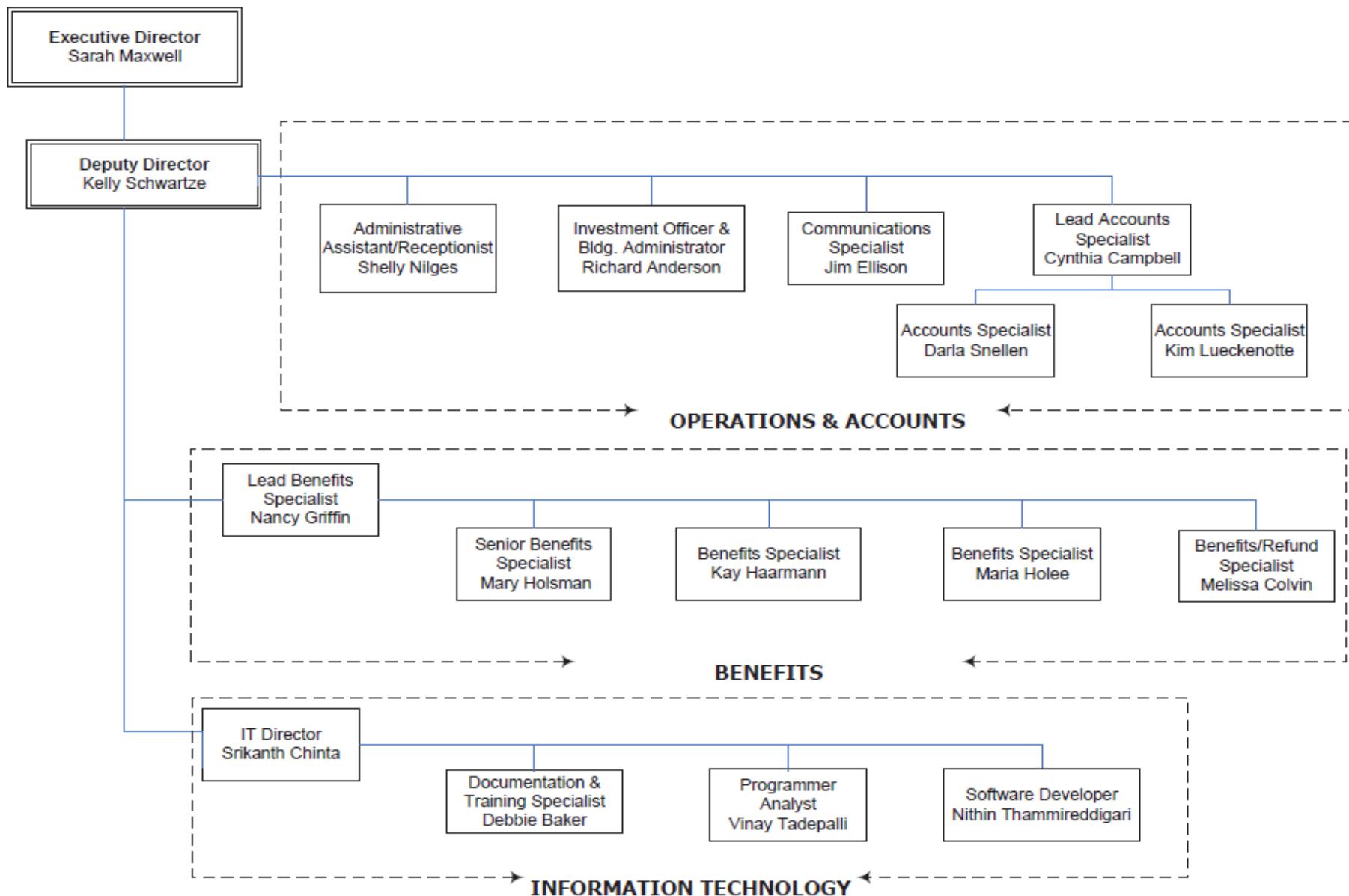
## 2018 Board of Directors

Tom Ruhl – Chair  
 Mark Price – Vice Chair  
 Conny Dover – Secretary  
 Jim Atchison – Member  
 Gary Emerson - Member

Collin Follis – Member  
 Ted Nichols – Member  
 Jim Platt – Member  
 June Pitchford – Member  
 Sherry Shamel – Member

# CERF Administrative Office

December 31, 2018



# FINANCIAL SECTION



## INDEPENDENT AUDITORS' REPORT

To the Board of Directors  
County Employees' Retirement Fund

We have audited the accompanying financial statements of the County Employees' Retirement Fund (CERF), which comprise the statement of fiduciary net position as of December 31, 2018, the related statement of changes in fiduciary net position for the year then ended, and the related notes to the financial statements.

### ***Management's Responsibility for the Financial Statements***

Management is responsible for the preparation and fair presentation of these financial statements in accordance with U.S. generally accepted accounting principles; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

### ***Auditors' Responsibility***

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with U.S. generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

### ***Opinion***

In our opinion, the financial statements referred to above present fairly, in all material respects, the fiduciary net position of the County Employees' Retirement Fund as of December 31, 2018, and the changes in fiduciary net position for the year then ended in accordance with U.S. generally accepted accounting principles.

## ***Other Matters***

### ***Required Supplementary Information***

U.S. generally accepted accounting principles require that the management's discussion and analysis; the schedules of changes in the net pension liability, net pension liability, employer contributions, and investment returns; and the notes to the schedules as listed in the table of contents be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with U.S. generally accepted auditing standards, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

### ***Other Information***

Our audit was conducted for the purpose of forming an opinion on the financial statements as a whole. The supplementary information as listed in the table of contents is presented for purposes of additional analysis and is not a required part of the financial statements. Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the financial statements. The information has been subjected to the auditing procedures applied in the audit of the financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the financial statements or to the financial statements themselves, and other additional procedures in accordance with U.S. generally accepted auditing standards. In our opinion, the information is fairly stated in all material respects in relation to the financial statements as a whole.

The introductory, investment, actuarial, and statistical sections have not been subjected to the auditing procedures applied in the audit of the basic financial statements and, accordingly, we do not express an opinion or provide any assurance on them.

*William Keeley UC*

June 6, 2019

## **COUNTY EMPLOYEES' RETIREMENT FUND MANAGEMENT'S DISCUSSION AND ANALYSIS**

The following Management's Discussion and Analysis (MD&A) of the County Employees' Retirement Fund's (CERF) financial performance provides an introduction to the financial statements of CERF for the year ended December 31, 2018. Since the MD&A is designed to focus on current activities, resulting changes and current known facts, please read it in conjunction with the financial statements.

### **Required Financial Statements**

CERF, a public employees' retirement plan, prepares its financial statements on the accrual basis in accordance with generally accepted accounting principles promulgated by the Governmental Accounting Standards Board (GASB). The Statement of Fiduciary Net Position includes all of CERF's assets and liabilities and provides information about the nature and amount of investments available to satisfy the pension benefits of the plan. All additions to and deductions from the net position held in trust for pension benefits are accounted for in the Statement of Changes in Fiduciary Net Position. This statement measures CERF's success over the past year in increasing the net position available for pension benefits.

### **Financial Analysis of CERF**

#### **Fiduciary Net Position**

The fiduciary net position is essentially the GASB accounting term for the fair value of assets. On a fair value of assets basis, the Fund's investment performance for year ended December 31, 2018 was below the assumed long-term return. On that basis the calculated return for the January 1, 2018 – December 31, 2018 fiscal year was (3.24)% compared to 14.55% for the prior year. That performance resulted in an investment loss of \$54.5 million.

#### **Total Pension Liability**

The total pension liability (TPL) refers to the actuarial accrued liability as calculated under the Entry Age Normal actuarial cost method in accordance with the GASB accounting standards. TPL increased from \$707,524,798 as of December 31, 2017 to \$742,631,649 as of December 31, 2018. Of the increase, \$35.9 million is attributable to the normal operation of the plan over the year, benefit accruals plus interest minus benefit payments. This increase was offset by approximately \$770,000 in actuarial gains from demographic experience differing from the assumptions.

#### **Net Pension Liability**

The net pension liability (NPL) is equal to the total pension liability minus the net fiduciary position. The net result of the investment losses relative to the expected long term rate of return was a decrease in the funded percentage from 72% as of December 31, 2017 to 66% as of December 31, 2018. The NPL increased from \$198.0 million to \$249.3 million.

## Actuarially Determined Contribution

Differences between the actuarial liabilities and the assets can be made up through (1) future contributions in excess of the normal costs to amortize the shortfall and/or (2) the excess of actual investment returns over assumed returns. An actuarial valuation sets out a schedule of future contributions that will deal with this deficiency in a systematic manner if future experience follows the assumptions. Since CERF's actual contributions are a combination of member contributions and county collected taxes, fees, and penalties, the actuarially determined contribution (ADC) is more of a measuring stick to assess the sufficiency of the current sources of contributions to CERF.

For 2018, the County portion of ADC was \$28,267,433, net of both member and County-paid employee contributions. The actual County contributions for 2018 totaled \$28,517,335, for an excess of \$249,902.

## Net Position

To begin the financial analysis, a summary of CERF's net position is as follows:

### Condensed Statements of Fiduciary Net Position

	2018	2017	Dollar Change	Percent Change
Cash and cash equivalents	\$ 4,140,965	\$ 3,168,815	\$ 972,150	31%
Receivables	4,666,276	3,930,079	736,197	19%
Investments	484,328,030	501,747,815	(17,419,785)	-3%
Invested securities lending collateral	64,745,149	50,171,889	14,573,260	29%
Other assets	-	13,352	(13,352)	-100%
Capital assets, net	5,418,029	5,695,324	(277,295)	-5%
 Total assets	 563,298,449	 564,727,274	 (1,428,825)	 0%
Liabilities	69,995,581	55,197,067	14,798,514	27%
 Total fiduciary net position	 \$ 493,302,868	 \$ 509,530,207	 \$ (16,227,339)	 -3%

Net position decreased by \$16,227,339 or 3%, in 2018. This decrease was a result of investment losses experienced during 2018, which is also the reason for the decrease in the December 31, 2018 investment balance. Securities lending collateral increased compared to prior year due to more investments on loan as of December 31, 2018.

### Condensed Statements of Changes in Fiduciary Net Position

	2018	2017	Dollar Change	Percent Change
<b>Additions:</b>				
Contributions:				
Counties receipts	\$ 28,517,335	\$ 21,006,080	\$ 7,511,255	36%
By members	13,303,261	12,366,187	937,074	8%
For members, paid by counties	2,300,484	1,977,497	322,987	16%
Members, purchase of prior service	94,579	72,243	22,336	31%
Total contributions	44,215,659	35,422,007	8,793,652	25%
Net investment income (loss)	(16,558,901)	64,424,975	(80,983,876)	-126%
Net securities lending activities	176,434	165,523	10,911	7%
Other income	8,808	6,441	2,367	37%
<b>Total additions</b>	<b>27,842,000</b>	<b>100,018,946</b>	<b>(72,176,946)</b>	<b>-72%</b>
<b>Deductions:</b>				
Benefits	\$ 33,439,139	\$ 31,129,540	\$ 2,309,599	7%
Refunds	3,810,029	3,678,904	131,125	4%
Defined contribution plan match	3,698,619	3,200,949	497,670	16%
Administrative expenses	3,121,552	3,249,395	(127,843)	-4%
<b>Total deductions</b>	<b>44,069,339</b>	<b>41,258,788</b>	<b>2,810,551</b>	<b>7%</b>
<b>Net increase (decrease)</b>	<b><u>\$(16,227,339)</u></b>	<b><u>\$ 58,760,158</u></b>	<b><u>\$(74,987,497)</u></b>	<b><u>-128%</u></b>

#### **Additions**

Additions needed to fund benefits are accumulated through contributions, which include both county fee receipts and employee contributions, and returns on invested funds. Contributions for 2018 totaled \$44,215,659, which was 25% above those received in 2017. Fiscal year 2018 was the first year of increased fees under Senate Bill 62, resulting in approximately \$7,800,000 of the increase in contributions. In addition, due to the legislation which took effect in 2003, as new employees continue to replace employees hired prior to February 25, 2002, employee contributions are expected to continue to rise.

Although CERF performed above the benchmark in almost all categories, 2018 overall was a poor market environment compared to 2017. As a result, CERF experienced an \$80,983,876 decrease in net investment income. The total rate of return for the CERF portfolio in 2018 was (3.11)%, as compared to 15.15% in 2017. For 2018, the S&P 500 Index return was (4.38)%, the BloomBar U. S. Aggregate Index was .01%, the Russell 2500 was (10.00)%, the NFI ODCE Index was 8.35%, the HFRI Equity Hedge was (6.94)%, and the MSCI EAFE Index was (13.36)%.

CERF participates in a Securities Lending Agreement with Key Bank, thus allowing CERF to lend its securities to broker-dealers, for the purpose of providing additional income to CERF. In 2018, CERF experienced a net unrealized securities lending gain of \$176,434, as compared to \$165,523 in 2017.

When comparing returns, it is important to note that CERF's investment objectives should be pursued as long-term goals designed to maximize return while reducing exposure to undue risk, as set out in the Board's investment policy. At a minimum, it is the objective of CERF to meet its actuarial interest assumption on an ongoing basis. Beginning in 2015, the actuarial assumption for investment return was changed from 8% to 7.5%. The desired objective on a long-term basis is to achieve an excess return over the actuarial assumption, net of investment management fees and transaction costs. Long term is defined as greater than 10 years. Some of the results for the total fund are:

<u>Period</u>	<u>Returns</u>	<u>Other Public Funds</u>
One Year	(3.60)%	19th Percentile
Three Years	5.11%	60th Percentile
Five Years	3.93%	60th Percentile
Ten Years	8.73%	15th Percentile
Since Inception	8.08%	

### **Deductions**

The expenses paid by CERF include benefit payments, refunds, a defined contribution plan match, and administrative expenses.

Expenses for 2018 totaled \$44,069,339, an increase of \$2,810,551 over 2017. The increase in benefit payments to members and beneficiaries of \$2,309,599 resulted primarily from growth in the number of annuitants to 5,321 in 2018 from 5,086 in 2017 (an increase of 235 payees). In addition, the amount of contributions refunded to terminated non-vested employees increased by 4% compared to 2017; this amount will fluctuate year to year based on employee turnover at the county level. The amount needed to fund the defined contribution plan match also increased by almost \$500,000 due to increased participation in the plan. The decrease in administrative expense was attributable to less software and hardware purchases in the current year and a decrease in salary and benefits expense due to the retirement of the former Deputy Director.

### **Economic Outlook**

CERF's estimated investment gain for the four months ended April 30, 2019, is approximately 11.39%. CERF's investments as of April 30, 2019 total approximately \$538,536,000, an increase of \$54,208,000 since December 31, 2018, due to investment return the first four months of the year. For the first four months of 2019, the S&P 500 Index return was 18.25%, the BloomBar U. S. Aggregate Index was 2.97%, the Russell 2500 was 19.88%, the NFI ODCE Index was 1.42%, and the MSCI EAFE Index was 13.33%.

### **Requests for Information**

This financial report is designed to provide the Board of Directors, our members, and other users of our financial report with a general overview of CERF's finances and to demonstrate CERF's accountability for the money it receives. If you have any questions about this report or need additional financial information, contact County Employees' Retirement Fund (CERF), 2121 Schotthill Woods Drive, Jefferson City, MO 65101.

**COUNTY EMPLOYEES' RETIREMENT FUND**

**STATEMENT OF FIDUCIARY NET POSITION**  
**December 31, 2018**

<b>ASSETS</b>	
Cash	\$ 4,140,965
Receivables:	
Member contributions	467,354
Member prior service contributions	137,225
County contributions	3,720,574
Receivable for pending investment sales	182,024
Accrued interest and dividends	<u>159,099</u>
Total receivables	4,666,276
Investments, at fair value:	
Common stocks	175,421,496
Fixed income mutual funds	145,582,728
Hedge funds	43,085,909
International equities funds	69,059,855
Real estate fund	22,299,504
Private equity	20,428,681
Cash equivalents	<u>8,449,857</u>
Total investments	484,328,030
Invested securities lending collateral	64,745,149
Capital assets, net of accumulated depreciation of \$1,892,843	<u>5,418,029</u>
Total assets	<u>563,298,449</u>
<b>LIABILITIES</b>	
Accounts payable	630,575
Accrued defined contribution plan funding	3,698,619
Other accrued expenses	151,532
Unearned revenue	39,388
Payable for pending investment purchases	140,118
Obligations under security lending agreements	<u>65,335,349</u>
Total liabilities	<u>69,995,581</u>
Net position - restricted for pension benefits	<u>\$ 493,302,868</u>

The notes to financial statements are an integral part of these statements.

## COUNTY EMPLOYEES' RETIREMENT FUND

### STATEMENT OF CHANGES IN FIDUCIARY NET POSITION For the Year Ended December 31, 2018

#### ADDITIONS:

##### Contributions:

County receipts	\$ 28,517,335
By members	13,303,261
For members, paid by counties	2,300,484
Members, purchase of prior service	<u>94,579</u>
Total contributions	<u>44,215,659</u>

##### Investment income:

###### Investing activities:

Net depreciation in fair value of investments	(22,934,405)
Fixed income securities	4,089,616
Equity securities	4,823,631
Other miscellaneous income	<u>160,263</u>
Total investment loss	<u>(13,860,895)</u>
Investment expenses	<u>(2,698,006)</u>
Net loss from investing activities	<u>(16,558,901)</u>

##### Securities lending activities:

Income	1,336,995
Expenses	<u>(1,160,561)</u>
Net income from securities lending activities	<u>176,434</u>
Total net investment loss	<u>(16,382,467)</u>
Other income	<u>8,808</u>
Total additions	<u>27,842,000</u>

#### DEDUCTIONS:

Benefits	33,439,139
Refunds of member contributions	3,810,029
Defined contribution plan matching contribution	3,698,619
Administrative expense	<u>3,121,552</u>
Total deductions	<u>44,069,339</u>

Net decrease (16,227,339)

Net position - restricted for pension benefits

Beginning of year	<u>509,530,207</u>
End of year	<u>\$ 493,302,868</u>

The notes to financial statements are an integral part of these statements.

## COUNTY EMPLOYEES' RETIREMENT FUND

### NOTES TO FINANCIAL STATEMENTS

#### 1. PLAN DESCRIPTION

The County Employees' Retirement Fund ("CERF") was established by an act of the Missouri General Assembly effective August 28, 1994. Laws governing the retirement fund are found in Sections 50.1000-50.1300 of the Missouri Revised Statutes (RSMo). The Board of Directors consists of eleven members, nine of whom are county employee or retiree participants. Two members, who have no beneficiary interest in CERF, are appointed by the Governor of Missouri. The Board of Directors has the authority to adopt rules and regulations for administering the system.

CERF is a mandatory cost-sharing multiple employer retirement system for each county in the state of Missouri, except any city not within a county (which excludes the City of St. Louis) and counties of the first classification with a charter form of government. CERF covers county elective or appointive officers or employees whose position requires the actual performance of duties not less than 1,000 hours per year; including employees of circuit courts located in a first class, non-charter county which is not participating in the Local Government Employees Retirement System (LAGERS); and does not cover circuit clerks, deputy circuit clerks, county prosecuting attorneys, and county sheriffs. Until January 1, 2000, employees hired before January 1, 2000, could opt out of the system.

CERF is a defined benefit plan providing retirement and death benefits to its members. All benefits vest after 8 years of creditable service. Employees who retire on or after age 62 are entitled to an allowance for life based on the form of payment selected. The normal form of payment is a single life annuity. Optional joint and survivor annuity and 10-year certain and life annuity payments are also offered to members in order to provide benefits to a named survivor annuitant after their death. Employees who have a minimum of 8 years of creditable service and who terminated employment after December 31, 1999 may retire with an early retirement benefit and receive a reduced allowance after attaining age 55. Annual cost-of-living adjustments, not to exceed 1%, are provided for eligible retirees and survivor annuitants, up to a lifetime maximum of 50% of the initial benefit which the member received upon retirement. Benefit provisions are fixed by state statute and may be amended only by action of the Missouri Legislature. Administrative expenses for the operation of CERF are paid out of the funds of the system.

*Contributions:* Prior to January 1, 2003, participating county employees, except for those who participated in LAGERS, were required to make contributions equal to 2% of gross compensation. Effective January 1, 2003, participating county employees hired on or after February 25, 2002 are required to make contributions of 4% if they are in a LAGERS county and contributions of 6% if they are in a non-LAGERS county. If an employee leaves covered employment before attaining 8 years of creditable service, accumulated employee contributions are refunded to the employee. The contribution rate is set by state statute and may be amended only by action of the Missouri Legislature.

Counties may elect to make all or a portion of the required 4% contribution on behalf of employees. Total county-paid member contributions for the year ended December 31, 2018 was \$2,300,484.

In addition, the following fees and penalties prescribed under Missouri law are required to be collected and remitted to CERF by counties covered by the plan:

- Late fees on filing of real estate and personal property tax declarations,
- Twenty dollars on each merchants and manufacturers license issued,
- Six dollars on each document recorded or filed with county recorders of deeds, with an additional one dollar on each document recorded,
- Five-ninths of the fee on delinquent property taxes, and
- Interest earned on investment of the above collections prior to remittance to CERF.

The fees and penalties collected and remitted to CERF by counties covered by the plan for the year ended December 31, 2018, were as follows:

Delinquent property tax fees	\$ 13,827,358	48.49%
Assessor late assessment filing fees	7,767,778	27.24%
Recorder document fees	4,843,494	16.98%
Merchants and manufacturers licenses	1,042,619	3.66%
Delinquent land list fees	948,285	3.33%
Interest on the above fees	<u>87,801</u>	<u>0.31%</u>
	<u><u>\$ 28,517,335</u></u>	<u><u>100%</u></u>

*Members:* CERF members include eligible employees of 111 counties in the State of Missouri. The number of members and benefit recipients served by the system at December 31, 2018 was:

Retirees and beneficiaries receiving benefits	5,321
Terminated employees entitled to but not yet receiving benefits	2,468
Current active plan members	<u>11,616</u>
Total	<u><u>19,405</u></u>

*Tax status:* The Internal Revenue Service has determined and informed CERF by letter dated September 28, 2011, that the plan as amended through November 1, 2010, is in a form acceptable under the Internal Revenue Code.

## 2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

*Basis of accounting:* CERF's financial statements are prepared using the accrual basis of accounting. Member and employer contributions are recognized in the period in which the contributions are due. Benefits are recognized when due and payable in accordance with the terms of the plan. Expenses are recorded when the corresponding liabilities are incurred, regardless of when payment is made.

*Method used to value investments:* Investments are reported at fair value. Short-term investments are reported at cost, which approximates fair value. Bonds and stocks traded on a national or international exchange are valued at the last reported sales price at current exchange rates as reported by independent pricing services. The values of real estate included in the real estate investment fund are based upon annual independent appraisals, updated quarterly, as provided by the fund manager. Investments that do not have an established market are reported at estimated fair value or net asset value as provided by investment or fund managers.

*Property and equipment:* Property and equipment, including computer software programs, are stated at cost less accumulated depreciation. Depreciation is calculated using the straight-line method over the estimated lives of the assets ranging from three to fifty years.

*Estimates:* The preparation of financial statements in conformity with U.S. generally accepted accounting principles requires management to make estimates and assumptions that affect certain reported amounts and disclosures. Accordingly, actual results could differ from those estimates.

### **3. DEPOSITS AND INVESTMENTS**

*Custodial credit risk for deposits:* Custodial credit risk is the risk that in the event of a bank failure, CERF's deposits may not be returned to it. At December 31, 2018, CERF's bank balances were secured by a combination of federal depository insurance and pledged collateral held in CERF's name by an agent of the depository bank.

*Investments:* Funds are invested by outside managers under policies established by the Board of Directors. The Board requires that its investment managers invest CERF's assets with the care, skill, and diligence a prudent person familiar with such matters acting in a like capacity would use in a similar enterprise with like objectives.

The following table summarizes CERF investments by type at December 31, 2018:

Common stocks	\$ 175,421,496
Fixed income mutual funds	145,582,728
Hedge funds	43,085,909
International equities funds	69,059,855
Real estate fund	22,299,504
Private equity	20,428,681
Cash equivalents	<u>8,449,857</u>
 Total	 <u>\$ 484,328,030</u>

CERF's investment policy permits investments in equity and fixed income (debt) securities and real estate, with guidelines for the percentage of the total for each category and for the type of investments within each category.

With respect to debt securities, the policy permits fixed and variable rate securities issued or guaranteed by the U.S. government, its agencies or instrumentalities; and U.S. government sponsored and other corporation securities. To manage interest rate and credit risks, two investment managers are used for debt securities, each operating under specific guidelines with respect to approved securities, duration, diversification, and minimum quality ratings by Moody's or Standard and Poor's.

Investment income in the statement of changes in fiduciary net position displays the realized and unrealized investment gains and losses from all investment types on the line item "Net depreciation in fair value of investments". Totals for interest, dividends, and other types of investment income are presented by broad categories of investments.

*Interest rate risk:* Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of an investment. CERF did not have any fixed income investments other than fixed income mutual funds as of December 31, 2018. As of December 31, 2018, the Baird Core Plus Bond Fund had a balance of \$50,749,068 and an average effective maturity of 7.82 years. The BlackRock Strategic Income Opportunities Fund had a balance of \$44,039,217 and an effective maturity of 4.18 years. The Loomis Sayles Fund had a balance of \$50,795,350 and an effective maturity of 8.39 years.

*Credit risk:* Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligation to the plan. CERF's fixed income mutual funds were unrated as of December 31, 2018.

*Concentration of credit risk:* Concentration of credit risk is the risk of loss attributed to the magnitude of a plan's investment in a single issuer. CERF's investment guidelines require diversified portfolios with no single issue, excluding U.S. government securities, being greater than 5% of each manager's total portfolio value at cost or 7% at fair value. As of December 31, 2018, no single issue exceeded the thresholds.

*Money-Weighted Rate of Return:* The annual money-weighted rate of return on pension plan investments, net of pension plan investment expenses, was (3.24)% for the year ended December 31, 2018. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for changing amounts actual invested.

*Foreign currency risk:* Foreign currency risk is the risk that changes in exchange rates will adversely affect the fair value of an investment. The following is a summary of CERF's international equities funds showing the exposure to foreign currency risk as of December 31, 2018:

Australian Dollar	\$ 632,432
Brazilian Real	1,881,448
China Yuan Renminbi	1,484,799
Euro	19,470,221
Hong Kong Dollar	1,163,093
Japanese Yen	12,972,921
Korean Won	376,257
Mexican Peso	1,690,761
Norwegian Krone	357,578
Russian Ruble	2,299,485
South African Rand	360,246
South Korean Won	2,046,710
Swiss Franc	3,768,523
Taiwan New Dollar	715,073
United Kingdom Pound	16,256,386
United States Dollar	<u>3,583,922</u>
Total	<u><u>\$ 69,059,855</u></u>

*Securities Lending Program:*

*Description of the program:* CERF participates in a securities lending program administered by KeyBank National Association (the custodian). Under this program, the Board of Directors has authorized CERF to lend its securities to broker-dealers with a simultaneous agreement to return the collateral for the same securities in the future. At the initiation of a loan, borrowers are required to provide cash collateral at 102% of the fair value of loaned securities. This cash collateral is then invested in certain qualified investments as detailed in the securities lending agreement. The maturities of the investments made with cash collateral do not generally match the maturity of security loans. There are no restrictions on the amount of securities that can be lent at one time. CERF does not have the ability to pledge or sell collateral securities unless the borrower defaults. CERF and the borrowers each maintained the right to terminate all security lending transactions on demand.

*Transactions with borrowers during the period:* Securities lent as of December 31, 2018 consisted of U.S. government and agency securities, U.S. equities, U.S. corporate bonds, and mortgage backed securities. The average term of securities loans was 1 day at December 31, 2018. The fair value, including accrued interest, of securities on loan was \$64,117,591 as of December 31, 2018. Because the fair value of collateral held exceeded the fair value of securities lent at December 31, 2018, CERF had no credit risk exposure to borrowers as of that date. There were no losses during the year resulting from a default of the borrowers or the custodial bank.

*Investment of cash collateral during the period:* The weighted average duration of collateral investments was 1.8 days at December 31, 2018. The fair value of collateral investments was \$64,745,149 as of December 31, 2018. CERF's securities lending policy states that in the event a security held in the collateral investments portfolio is downgraded below A3 by Moody's or A- by Standard and Poor's that a potential course of action be discussed. Such potential actions include selling the security as soon as possible or holding the security in the hopes of an improved market. As of December 31, 2018, 1% or \$396,056, of the total fair value of the collateral investments portfolio was in securities that had fallen below these minimum ratings thresholds. The fair value of collateral investments was \$590,200 less than the liability for the collateral held for securities on loan as of December 31, 2018. The agreement between CERF and the securities lending agent does not provide for indemnification to CERF for any loss incurred as a result of CERF's participation in the program.

*Securities lending income:* Securities lending income from CERF's share of income on investments made from cash collateral less borrower rebates and fees of the securities lending agent was \$176,434 for 2018.

The following table summarizes duration by investment type as of December 31, 2018 for securities lending invested collateral subject to interest rate risk:

Investment	Fair Value	Effective Duration Rate
Repurchase agreements	\$ 45,800,000	1-91 days
Commercial paper	6,277,694	1-7 days
Money market funds	12,271,399	1 day
Corporate notes	395,961	7-262 days
Asset backed securities	95	1 day
Total	<u><u>\$ 64,745,149</u></u>	

The following table summarizes credit ratings by investment type as of December 31, 2018 for securities lending invested collateral subject to credit risk:

Moody's Credit Rating Level	Repurchase Agreements	Commercial Paper	Money Market Funds	Corporate Notes	Asset Backed Securities
Not rated	\$ 33,500,000	\$ 3,278,715	\$ 12,271,399	\$ 395,961	\$ -
P1	12,300,000	2,998,979	-	-	-
Ca	-	-	-	-	95
<b>Total</b>	<b>\$ 45,800,000</b>	<b>\$ 6,277,694</b>	<b>\$ 12,271,399</b>	<b>\$ 395,961</b>	<b>\$ 95</b>

CERF categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles. The hierarchy is based on the valuation inputs used to measure the fair value of the asset and give the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (level 1 measurements) and the lowest priority to unobservable inputs (level 3 measurements).

- Level 1 – unadjusted quoted prices for identical instruments in active markets.
- Level 2 – quoted prices for similar instruments in active markets; quoted prices for identical or similar instruments in markets that are not active; and model-derived valuations for which all significant inputs are observable.
- Level 3 – valuations derived from valuation techniques in which significant inputs are unobservable.

Investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient are not classified in the fair value hierarchy.

The categorization of investments within the hierarchy is based upon the pricing transparency of the instrument and should not be perceived as the particular investment's risk.

In instances where inputs used to measure fair value fall into different levels in the fair value hierarchy, fair value measurements in their entirety are categorized based on the lowest level input that is significant to the valuation. CERF's assessment of the significance of particular inputs to these fair value measurements requires judgment and considers factors specific to each asset or liability.

Equities within all asset classes that are classified in Level 1 are valued using prices quoted in active markets for those securities. Equity securities classified in Level 2 are securities whose values are derived daily from associated traded securities. Equity securities classified in Level 3 are valued with last trade data having limited trading volume.

Fixed income securities within all asset classes that are classified in Level 2 are valued using either a bid evaluation or a matrix pricing technique. Bid evaluations may include market quotations, yields, maturities, call features and ratings. Matrix pricing is used to value securities based on the securities relationship to benchmark quoted prices. Level 2 fixed income securities have non-proprietary information that was readily available to market participants, from multiple independent sources, which are known to be actively involved in the market.

The fair values of investments in certain funds are based on the investments' net asset value (NAV) per share (or its equivalent) and are presented in the above table. Investments that are measured at fair value using the net asset value (or its equivalent) as a practical expedient are not classified in the fair value hierarchy.

Investments by Fair Value	Total	Level 1	Level 2	Level 3
Equity securities				
Domestic common stock				
Communication services	\$ 8,806,939	\$ 8,806,939	\$ -	\$ -
Consumer discretionary	21,459,634	21,459,634	-	-
Consumer staples	7,836,870	7,836,870	-	-
Energy	4,228,631	4,228,631	-	-
Financials	31,247,265	31,247,265	-	-
Healthcare	26,662,157	26,662,157	-	-
Industrials	20,496,921	20,496,921	-	-
Information technology	34,191,413	34,191,413	-	-
Materials	6,320,194	6,320,194	-	-
Real estate	3,309,049	3,309,049	-	-
Utilities	1,649,886	1,649,886	-	-
Total domestic common stock	166,208,959	166,208,959	-	-
International common stock				
Consumer discretionary	1,200,944	1,200,944	-	-
Energy	660,508	649,871	-	-
Financials	129,068	129,068	-	-
Healthcare	2,012,880	2,012,880	-	-
Industrials	873,820	873,820	-	-
Information technology	1,294,491	1,294,491	-	-
Materials	221,951	221,951	-	-
Other	1,900,288	1,900,288	-	-
Real estate	424,470	424,470	-	-
Utilities	536,023	536,023	-	-
Total international common stock	9,254,443	9,243,806	-	-
Fixed income mutual funds				
Total investments at fair value	94,787,378	94,787,378	-	-
Invested securities lending collateral				
Collateralized mortgage obligations	394,764	\$ -	\$ 394,764	\$ -
Commercial paper	6,277,694	-	6,277,694	-
Mutual funds	12,275,291	12,275,291	-	-
Repurchase agreements	45,800,000	-	45,800,000	-
Total invested securities lending collateral	64,747,749	\$ 12,275,291	\$ 52,472,458	\$ -
Investments exempt from fair value hierarchy				
Short term investments		8,449,857		
Investments measured at net asset value (NAV)				
Commingled international equity funds	69,059,855			
Commingled fixed income fund	50,795,350			
Commingled real estate investment fund	22,299,504			
Hedge funds	43,085,909			
Private equity limited partnership funds	20,428,681			
Total investments measured at NAV	205,669,299			
Total	\$ 549,117,685			

Reconciliation to Statement of Fiduciary Net Position

Total	\$ 549,117,685
Securities lending collateral	(64,747,749)
Receivable for pending investment sales	(182,024)
Payable for pending investment purchases	<u>140,118</u>
Investments per Statement of Fiduciary Net Position	<u><u>\$ 484,328,030</u></u>

Investments Measured at Net Asset Value	Total	Unfunded Commitments	Redemption Frequency	Redemption Notice Period
Commingled international equity funds	\$ 69,059,855	\$ -	Daily, monthly	1-7 days
Commingled fixed income fund	50,795,350	-	Daily	1 day
Commingled real estate investment fund	22,299,504	-	Quarterly	45 days
Hedge funds				
Long/short equity fund	43,085,909	-	Quarterly	45 days
Private equity limited partnership funds	<u>20,428,681</u>	<u>11,175,186</u>	Not eligible	N/A
Total investments measured at NAV	<u><u>\$ 205,669,299</u></u>	<u><u>\$ 11,175,186</u></u>		

Commingled international equity funds, fixed income fund, and real estate investment fund: Consisting of two international equity funds (long-term capital appreciation), one fixed income fund (high total investment return through current income and capital appreciation), and one real estate investment fund (high level of current income with moderate appreciation), these funds are considered commingled in nature. These funds are valued at NAV of units held at the end of period based upon the fair value of the underlying investments.

Long/short equity hedge fund: Consisting of one fund, this strategy invests in both long and short in global equity marketable securities, and can be both long and short in its positioning. This fund seeks to provide diversification by holding a number of funds within a single fund structure. This investment is valued at NAV and is redeemable quarterly.

Private equity limited partnership funds: Consisting of two funds, these investments are valued at NAV. The funds are not eligible for redemption. Distributions are received as underlying investments within the funds are liquidated, which on average can occur over the span of 10 years.

#### 4. CAPITAL ASSETS

Capital assets consist of the following as of December 31, 2018:

	December 31, 2017	Additions	Disposals	December 31, 2018
Capital assets not being depreciated:				
Land	\$ 932,050	\$ -	\$ -	\$ 932,050
Total capital assets, not being depreciated	932,050	-	-	932,050
Capital assets being depreciated:				
Building	3,027,146	5,990	-	3,033,136
Equipment, furnishings and software	4,636,282	4,976	(1,295,572)	3,345,686
Total capital assets, being depreciated	7,663,428	10,966	(1,295,572)	6,378,822
Less accumulated depreciation for:				
Building	867,176	66,934	-	934,110
Equipment, furnishings and software	2,032,978	221,327	(1,295,572)	958,733
Total accumulated depreciation	2,900,154	288,261	(1,295,572)	1,892,843
Total capital assets being depreciated, net	4,763,274	(277,295)	-	4,485,979
Total capital assets, net	\$ 5,695,324	\$ (277,295)	\$ -	\$ 5,418,029

#### 5. NET PENSION LIABILITY OF EMPLOYERS

The components of the net pension liability of employers as of December 31, 2018 are as follows:

Year Ended	Total Pension Liability (TPL) (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (NPL) (a - b)	Plan Fiduciary Net Position as a % of TPL (b/a)	Covered Payroll (c)	NPL as a % of Covered Payroll ((a-b)/c)
12/31/2018	\$ 742,631,649	\$ 493,302,868	\$ 249,328,781	66.43%	\$ 414,454,785	60.16%

##### *Actuarial assumptions*

Actuarial valuations of the Plan involve estimates of the reported amount and assumptions about probability of occurrence of events far into the future. Examples include assumptions about future employment, mortality and future compensation increases. Amounts determined regarding the net pension liability are subject to continual revision as actual results are compared with past expectations and new estimates are made about the future.

The purpose of the schedule of net pension liability is to present multi-year trend information about whether the Plan's fiduciary net position is increasing or decreasing over time relative to the total pension liability. This schedule is presented in the required supplementary information following the notes to the financial statements. Until a full 10-year trend is completed, the multi-year information will be added as it becomes available.

The total pension liability as of December 31, 2018, was based on the most recent actuarial valuation as of December 31, 2017, rolled forward to December 31, 2018, using the following actuarial assumptions. An actuarial experience study is performed every 5-years. The most recent actuarial experience study covered the period 2008 through 2013. The next actuarial experience study will be performed in 2019 and will cover the period 2014 through 2018.

Actuarial cost method	Entry age normal
Investment rate of return	7.5%
Inflation	2.5%
Compensation increases	2.5%, plus merit
Mortality rates	RP-2000 Combined Mortality projected to 2022 using Scale BB

#### *Sensitivity of the net pension liability*

The sensitivity of the net pension liability of employers to changes in the discount rate is presented below.

As of December 31, 2018, the net pension liability calculated using the discount rate of 7.5% is presented as well as what the employers' net pension liability would be using a discount rate that is 1% lower (6.5%) or 1% higher (8.5%) than the current rate.

	1% Decrease (6.5%)	Current Rate (7.5%)	1% Increase (8.5%)
Net pension liability	\$346,039,227	\$249,328,781	\$169,013,337

#### *Long-term expected rate of return*

The long-term expected rate of return on the Plan's investments was determined using a building-block method in which best-estimate ranges of expected future real rates of returns (expected returns, net of investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the Plan's target allocations for 2018 are summarized below along with the long term geometric return. Geometric return (also referred to as the time weighted return) is considered standard practice within the investment management industry. Geometric returns represent the compounded rate of growth of a portfolio. The method eliminates the effects created by cash flows.

Asset Class	Target Asset Allocation	Long-Term Arithmetic Basis	
		Expected Real Return	Expected Real Return
U.S. Large Cap Equity	26.00%	5.84%	1.52%
Core Plus	21.00%	2.84%	0.60%
Non-U.S. Equity	14.00%	6.60%	0.92%
Long/Short Equity	9.00%	4.98%	0.45%
U.S. Small Cap Equity	12.00%	6.83%	0.82%
Absolute Return	9.00%	4.05%	0.36%
Core Real Estate	5.00%	6.34%	0.32%
Private Equity	4.00%	8.88%	0.36%
Total	<u>100.00%</u>		5.34%
		Inflation	2.50%
		Long-term expected geometric return	<u>7.84%</u>

The discount rate used to measure the total pension liability as of December 31, 2018 was 7.5%. The projection of cash flows used to determine the discount rate assumed that contributions from plan members will be made at the current statutory rates and that contributions from employers will be made based on the Plan's revenue sources (various fees and penalties paid to the counties). Such revenue was assumed to increase at the rate of 1% per year. This increase assumption has been used by the Plan in prior funding status projections. Historically, revenue increase has averaged more than 1% per year. Based on the assumptions, the Plan's fiduciary net position was projected to be available to make projected future benefit payments of current plan members. The projections covered an 80-year period into the future. The long-term expected rate of return on the Plan's investments was applied to projected benefit payments.

## **6. PRIOR SERVICE CONTRIBUTIONS**

An eligible county employee who was employed prior to CERF's inception on August 28, 1994, is considered to have prior service. If the employee was working on June 10, 1999, and worked through January 1, 2000, the prior service is awarded. This means the employee does not have to purchase the service to have it deemed creditable. If the employee did not work continually from June 10, 1999, through January 1, 2000, the prior service must be purchased to become creditable. The prior service is calculated at the time of retirement and can be paid in one lump sum or over a period of up to 48 months. The monthly pension benefit is reduced by the buyback amount until the prior service has been paid in full.

An eligible county employee who was employed on January 1, 1990, but not employed on August 28, 1994, and who had at least eight years of service is classified as a special consultant. A special consultant can elect to purchase eight years or more of their service in order to receive a CERF benefit. Since a special consultant would have terminated employment prior to CERF's inception, they are required to make a larger buyback and must pay at least 50% of this amount up front. The remaining amount is deducted from the monthly pension benefit for up to 48 months.

An eligible county employee who opted out of the system prior to January 1, 2000, had the option to become a member within three months of the three year anniversary of the decision to opt out. Upon deciding to opt in to the system, such employee either purchased in total or began payroll deductions to purchase all or part of their prior creditable service plus interest over a maximum period of four years. Such amounts were recognized as contributions when received by CERF.

The receivables for member prior service contributions shown on the accompanying statements of fiduciary net position represent the total amount, as of December 31, 2018, that are due in future periods from retirees who have elected to purchase prior service.

## **7. RETIREMENT PLANS FOR FUND EMPLOYEES**

All full-time employees of CERF are eligible for participation in a defined contribution plan. CERF contributes 6% of a participating employee's monthly gross salary to the plan. The contribution requirements of the plan are governed by the plan document, which may be amended by the Board of Directors. Employees do not contribute to the retirement plan. Employees become vested in contributions made by CERF after 5 years of creditable service. Total contributions for the year ended December 31, 2018 were \$84,453.

All full-time employees are eligible for participation in an Internal Revenue Code (IRC) 457 deferred compensation plan upon their eligibility in the defined contribution plan.

## **8. DEFINED CONTRIBUTION AND DEFERRED COMPENSATION PLANS**

*Plan description:* Effective January 1, 2000, CERF also administers a defined contribution plan and an IRC Section 457 deferred compensation plan. Members of the pension plan are eligible to participate.

The plans were established to provide an opportunity for members of the pension plan to have additional retirement benefits. The plans' provisions and contribution requirements are established and may be amended only by action of the Missouri Legislature.

*Contributions:* Pension plan members who are not members of LAGERS are required to contribute 0.7% of gross compensation to the defined contribution plan. Contributions of \$1,076,422 were made during the year ended December 31, 2018. Participation in the 457 plan is voluntary. The level of contributions to the 457 plan is elected by the employee, subject to the limitations of IRC Sections 401(a) and 457. CERF's Board of Directors determines if matching contributions from the pension plan trust funds for a calendar year will be made to the defined contribution plan accounts of those who participated in the 457 plan and met the applicable service criteria during the plan year. The amount of any matching contribution is limited to an amount not needed to keep the pension plan actuarially sound. The matching contribution is also limited to 50% of a member's voluntary contributions to the 457 plan, up to 3% of the member's compensation. Members vest in the matching portion of contributions allocated to their respective accounts after five years of creditable service. Matching contributions for the year ended December 31, 2018 were \$3,698,619.

*Administration:* Maintenance of individual member accounts and custody of assets have been contracted to a third party administrator and investment custodian, respectively. Member contributions are sent directly to the third party administrator by the counties. Members can self-direct investments of their contributions and their respective share of matching contributions in a number of investment options. Separate trust funds are maintained for the defined contribution and 457 plan assets.

Because CERF does not hold the plans' assets and does not have significant administrative responsibilities, the plans' assets and changes in net assets are not reported in CERF's financial statements.

## **9. RISK MANAGEMENT**

CERF is exposed to various risks of loss related to natural disasters, errors and omission, loss of assets, torts, etc. CERF has chosen to cover such losses through the purchase of commercial insurance. There have been no significant insurance claims filed or paid during the past three years.

**COUNTY EMPLOYEES' RETIREMENT FUND**

**REQUIRED SUPPLEMENTARY INFORMATION**  
**SCHEDULE OF CHANGES IN THE NET PENSION LIABILITY**  
**For the Years Ended December 31, 2018, 2017, 2016, 2015 and 2014**

	2018	2017	2016	2015	2014
Total pension liability					
Service cost	\$ 19,941,921	\$ 19,108,969	\$ 18,004,559	\$ 17,052,205	\$ 13,595,040
Interest cost	53,188,413	50,835,611	47,131,401	44,726,570	41,986,362
Difference between actual and expected experience	(774,315)	(3,400,101)	(14,041,749)	9,248,266	(1,804,223)
Benefit payments, including refunds of member contributions	(37,249,168)	(34,808,444)	(31,460,383)	(29,901,257)	(27,411,906)
Effect of assumption changes or inputs	-	-	30,295,003	33,428,440	-
Net change in total pension liability	35,106,851	31,736,035	49,928,831	74,554,224	26,365,273
Total pension liability - beginning of year	<u>707,524,798</u>	<u>675,788,763</u>	<u>625,859,932</u>	<u>551,305,708</u>	<u>524,940,435</u>
Total pension liability - end of year	<u><u>\$ 742,631,649</u></u>	<u><u>\$ 707,524,798</u></u>	<u><u>\$ 675,788,763</u></u>	<u><u>\$ 625,859,932</u></u>	<u><u>\$ 551,305,708</u></u>
Plan fiduciary net position					
Employer contributions	\$ 28,517,335	\$ 21,006,080	\$ 20,329,625	\$ 19,968,537	\$ 19,781,514
Member contributions	15,698,324	14,415,927	13,799,759	13,115,748	11,899,932
Net investment return (loss)	(16,373,659)	64,596,939	21,571,995	99,571	17,958,335
Benefit payments, including refunds of member contributions	(37,249,168)	(34,808,444)	(31,460,383)	(29,901,257)	(27,411,906)
Defined contribution plan match	(3,698,619)	(3,200,949)	(3,133,484)	(2,861,751)	(2,696,164)
Administrative and other expenses	(3,121,552)	(3,249,395)	(2,841,954)	(2,522,685)	(2,125,444)
Net change in Plan fiduciary net position	(16,227,339)	58,760,158	18,265,558	(2,101,837)	17,406,267
Plan fiduciary net position - beginning of year	<u>509,530,207</u>	<u>450,770,049</u>	<u>432,504,491</u>	<u>434,606,328</u>	<u>417,200,061</u>
Plan fiduciary net position - end of year	<u><u>493,302,868</u></u>	<u><u>509,530,207</u></u>	<u><u>450,770,049</u></u>	<u><u>432,504,491</u></u>	<u><u>434,606,328</u></u>
Net pension liability - end of year	<u><u>\$ 249,328,781</u></u>	<u><u>\$ 197,994,591</u></u>	<u><u>\$ 225,018,714</u></u>	<u><u>\$ 193,355,441</u></u>	<u><u>\$ 116,699,380</u></u>

*Note: This schedule is intended to show information for ten years. Additional years will be displayed as they become available.*

**COUNTY EMPLOYEES' RETIREMENT FUND**

**REQUIRED SUPPLEMENTARY INFORMATION**  
**SCHEDULE OF NET PENSION LIABILITY**  
**For the Years Ended December 31, 2018, 2017, 2016, 2015 and 2014**

Year Ended	Total Pension Liability (TPL) (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (NPL) (a - b)	Plan Fiduciary Net Position as a % of TPL (b/a)	Covered Payroll (c)	NPL as a % of Covered Payroll ((a-b)/c)
12/31/2018	\$ 742,631,649	\$ 493,302,868	\$ 249,328,781	66.43%	\$ 414,454,785	60.16%
12/31/2017	707,524,798	509,530,207	197,994,591	72.02%	401,037,836	49.37%
12/31/2016	675,788,763	450,770,049	225,018,714	66.70%	391,801,920	57.43%
12/31/2015	625,859,932	432,504,491	193,355,441	69.11%	372,165,232	51.95%
12/31/2014	551,305,708	434,606,328	116,699,380	78.83%	371,471,731	31.42%

*Note: This schedule is intended to show information for ten years. Additional years will be displayed as they become available.*

**COUNTY EMPLOYEES' RETIREMENT FUND**

**REQUIRED SUPPLEMENTARY INFORMATION**  
**SCHEDULE OF EMPLOYER CONTRIBUTIONS**

Year Ended December 31	Actuarially Determined Contribution	Actual Employer Contributions	Contribution Excess/ (Deficiency)	Actual Covered Member Payroll	Contributions as a % of Covered Payroll
2009	\$ 19,974,884	\$ 20,347,932	\$ 373,048	\$ 347,697,487	5.85%
2010	19,353,216	19,739,918	386,702	356,101,368	5.54%
2011	17,641,319	19,364,023	1,722,704	349,451,052	5.54%
2012	18,663,294	19,919,125	1,255,831	352,112,336	5.66%
2013	19,441,738	20,348,888	907,150	358,016,680	5.68%
2014	18,623,038	19,781,514	1,158,476	366,151,670	5.40%
2015	22,051,507	19,968,537	(2,082,970)	372,165,232	5.37%
2016	25,608,251	20,329,625	(5,278,626)	391,801,920	5.19%
2017	26,677,238	21,006,080	(5,671,158)	401,037,836	5.24%
2018	28,267,433	28,517,335	249,902	414,454,785	6.88%

## COUNTY EMPLOYEES' RETIREMENT FUND

### REQUIRED SUPPLEMENTARY INFORMATION SCHEDULE OF INVESTMENT RETURNS

Year Ended December 31	Investment Returns, Net of Investment Expenses	
	Time Weighted	Money Weighted
2009	22.90%	*
2010	14.00%	*
2011	-0.50%	*
2012	13.20%	*
2013	19.30%	*
2014	4.30%	4.34%
2015	0.00%	0.00%
2016	5.03%	5.06%
2017	14.42%	14.55%
2018	-3.21%	-3.24%

*\*CERF has calculated the annual time-weighted returns since inception in 1995. However, data for the money-weighted returns is only available starting with 2014.*

## COUNTY EMPLOYEES' RETIREMENT FUND

### NOTES TO REQUIRED SUPPLEMENTARY INFORMATION

The information presented in the required supplementary information was determined as part of the most recent actuarial valuation as of December 31, 2017, rolled forward to December 31, 2018. Additional information as of these actuarial valuations follows.

*Changes in benefit terms:* On October 1, 2007, significant benefit improvements were made for members retiring on or after that date. The cost impact of the improvements was first incorporated in 2008.

*Actuarial methods and assumptions:* The actuarially determined contribution rates in the schedule of employers' contributions are calculated as of January 1 of the respective calendar year.

The following actuarial methods and assumptions were used to determine contribution rates reported in the schedule as of December 31, 2018.

Actuarial cost method	Entry age normal
<b>Amortization method:</b>	
Level percent or dollar	Level percent
Closed, open, or layered periods	Layered
Amortization period	20 years
Amortization growth rate	2.5%
<b>Asset valuation method</b>	
Actuarial value of assets with 5 years smoothing of gains and losses, subject to a 20% corridor around fair value	
Investment rate of return	7.5%
Inflation	2.5%
Compensation increases	2.5%, plus merit
Cost of living adjustments	1.0% per annum; 50% cap on initial benefit
Retirement age	Rates vary by age as shown in Appendix A of the January 1, 2019 Actuarial Valuation Report
Turnover	Select and ultimate rates based on age and service as shown in Appendix A of the January 1, 2019 Actuarial Valuation
Mortality rates	RP-2000 Combined Mortality projected to 2022 using Scale BB

**COUNTY EMPLOYEES' RETIREMENT FUND**

**SCHEDULE OF ADMINISTRATIVE EXPENSES**  
**For the Year Ended December 31, 2018**

Personnel services	
Staff salaries	\$ 1,437,573
Payroll taxes	96,256
Retirement	84,453
Insurance	<u>194,670</u>
Total personnel services	<u>1,812,952</u>
Professional services	
Actuarial	66,371
Audit	85,967
Legal counsel	174,497
Legislative consultant	77,000
Litigation	28,555
Plan design and implementation consultants	<u>275,424</u>
Total professional services	<u>707,814</u>
Communication	
Printing	19,471
Postage	22,113
Telephone and internet	<u>39,151</u>
Total communication	<u>80,735</u>
Rentals	
Equipment leasing and maintenance	<u>49,325</u>
Total rentals	<u>49,325</u>
Depreciation	<u>288,261</u>
Miscellaneous	
Utilities	25,044
Board of directors expenses	12,859
County visits and association conferences	12,405
Due diligence visits	4,159
Business risk insurance premiums	17,530
Staff development and Board education	21,721
Office	<u>88,747</u>
Total miscellaneous	<u>182,465</u>
Total administrative expenses	<u>\$ 3,121,552</u>

## **COUNTY EMPLOYEES' RETIREMENT FUND**

### **SCHEDULE OF INVESTMENT EXPENSES** **For the Year Ended December 31, 2018**

Investment management expenses	
Domestic stocks	\$ 1,228,498
International stocks	534,614
Bonds	144,321
Private equity	196,934
Real estate	<u>217,201</u>
Total investment management expenses	<u>2,321,568</u>
Other investment expenses	
Investment consultants	253,895
Investment custodian	121,451
Bank depository	<u>1,092</u>
Total other investment expenses	<u>376,438</u>
Total investment expenses	<u><u>\$ 2,698,006</u></u>
Securities lending expenses	
Borrower rebates	\$ 1,126,455
Agent fees	<u>34,106</u>
Total securities lending expenses	<u><u>\$ 1,160,561</u></u>

# INVESTMENT SECTION





**COUNTY EMPLOYEES'  
RETIREMENT FUND**

June 6, 2019

Dear Board of Directors and CERF members:

CERF's investment portfolio for the fiscal year ended December 31, 2018, had a loss of 3.11%, as calculated using a time-weighted rate of return methodology based upon market values. All of the plan's underlying asset class pools had negative returns, except for Real Assets and Private Equity. The returns across the three major asset classes were dispersed, illustrating the impact on asset allocation to help reduce the volatility of annual returns while focusing on the long-term performance objectives.

CERF's US Large Cap Equity portfolio had a loss of (5.05)% compared to the equity benchmark of (4.38)%. The US Small/Mid Cap Equity portfolio returned (1.29)% compared to the benchmark of (10)%, Non-US Equity returned (11.06)% compared to the benchmark of (13.36)%, Global Equity had a return of (6.4)% compared to the benchmark of (6.94)%, and Private Equity returned 4.89% compared to the benchmark of (4.38)%. Underperformance by the equity portfolios for the year was mainly driven by poor stock selection in large cap value.

CERF's Fixed Income portfolio returned (.18)%, compared to the fixed income benchmark of .01%. Underperformance for the year was mainly driven by security selection, high yield bonds, and being underweight in U.S. Treasury Bills.

CERF's Real Assets portfolio returned 8.03%, compared to the real assets benchmark of 8.35%. Underperformance for the year was mainly driven by property selection.

These returns were calculated by CERF's investment consultant, Asset Consulting Group.

The success of the investment program is defined by its adherence to the investment policy guidelines, and its performance compared to the stated return objectives and risk parameters.

The following chart shows the pension fund's annualized performance and risk since its inception compared to the stated objectives:

**Total Pension Fund Performance vs. Objectives  
December 31, 1994 - December 31, 2018**

<b>Return Objectives</b>	<b>Benchmark</b>	<b>CERF</b>
At a minimum, it is the objective of CERF to exceed its actuarial interest rate assumption on an ongoing basis.	7.5%	8.4%
The pension fund's annualized total return should equal or exceed the annualized rate of inflation as indicated by the Consumer Price Index by 5%	7.3%	8.4%

**Total Pension Fund Performance vs. Objectives**  
**December 31, 1994 - December 31, 2018**

<b>Risk Objective</b>	<b>Benchmark</b>	<b>CERF</b>
The pension fund's total return should exceed the total return of the Policy Index.	8.2%	8.4%
The pension fund's level of risk, as measured by Standard Deviation, should be consistent with the risk the Policy Index.	9.5%	9.4%

*The Policy Index consists of 65% MSCI ACWI, 30% BloomBar US Aggregate, and 5% NFI ODCE.*

As reflected above, CERF is meeting or exceeding our performance objectives. The pension plan asset will continue to be managed with a long term focus, as it is expected that over shorter time periods, investment performance will remain volatile. CERF will also continue to manage investments with a belief that asset allocation remains the most significant driver of investment performance and the consistent execution of the investment process will have a significant influence on achieving the plan's objectives.

Respectfully submitted,



Richard Anderson  
Investment Officer



Kelly Schwartze, CPA  
Deputy Director

## Investment Objectives

CERF's investment program exists for the purpose of providing retirement income to the plan's participants. The pension plan's assets are invested in a manner that is consistent with its investment policy; a formal document that articulates the fund's goals, objectives, and risk parameters, and states the importance of diversification, risk management and a long-term, strategic investment time horizon.

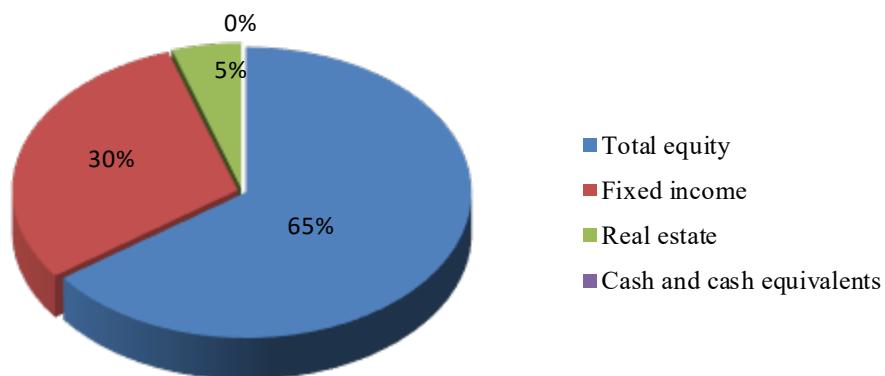
CERF's investment portfolio has exposures to each of the broad investment categories (stocks, bonds, and real estate), sub-asset classes (large cap stocks, small cap stocks, etc.) and geographic regions (U.S., non-U.S.). There are three major asset categories used – equity, fixed income, and real estate. CERF has established a target allocation for each of these categories, which includes a variance of up to 5%.

The following table summarizes the fair value of investments as of December 31, 2018, along with the target allocations as set forth in the investment policy:

Asset Class *	Asset Allocation		
	Fair Value	% of Total Fair Value	Target Allocation
<b>Equity</b>			
U.S. Large Cap equity	\$ 125,810,644	26%	25%
U.S. Small/Mid Cap equity	55,907,180	12%	10%
Non-U.S. equity	69,059,855	14%	15%
Global equity	43,085,909	9%	10%
Private equity	20,428,681	4%	5%
Total equity	314,292,270	65%	65%
Fixed income	145,583,633	30%	30%
Real estate	22,299,504	5%	5%
Cash and cash equivalents	2,152,623	0%	0%
Total investments	\$ 484,328,030	100%	100%

\*Certain investments have been reclassified for investment management purposes. As such, classifications may not agree with the audited financial statements.

### Asset Allocation - Asset Class



CERF's portfolio structure is regularly monitored by the investment consultant, CERF's internal staff, and its Board of Directors. The portfolio is rebalanced when appropriate to keep allocations to various investments within the stated ranges defined in the investment policy. New asset classes are periodically added to the mix to enhance diversification. Although long-term focused, the portfolio is adjusted as needed to take into consideration near-term risks and opportunities.

### **Equity Investments**

CERF invests in different types of equities (stocks) for the growth opportunities they provide. CERF's portfolio currently has exposure to domestic stocks, international stocks, hedged equity funds, and private equity in different size categories (small, mid, and large capitalization), in different styles (value and growth), and with different investment management organizations.

### **Fixed Income Investments**

CERF's fixed income (bond) portfolio is in place to enhance diversification and provide liquidity and downside protection. The fixed income portfolio is also diversified and invested across the fixed income markets, with an emphasis on high quality bonds. The portfolio has exposure to various quality, sector, geography, and security types.

### **Real Assets Investments**

Real estate investments provide an additional layer of diversification to the portfolio, as they behave differently than stocks and bonds.

CERF's current allocation to real estate is achieved through a diversified real estate fund. The fund has exposure to different geographic locations and property types, while maintaining strict quality requirements for each property, including leverage limits and occupancy rates.

The following investment results were prepared by CERF's consultant using a time-weighted rate of return methodology based upon market values, and are gross of fees.

**Investment Results**  
**For the Year Ended December 31, 2018**

Asset Class *	Fair Value	Annualized Rate of Return				Since Inception Performance
		1 Year	3 Years	5 Years	10 Years	
<b>Equity</b>						
<b>U.S. Large Cap equity</b>	<b>\$ 125,810,644</b>	<b>-5.05%</b>	<b>7.89%</b>	<b>6.85%</b>	<b>14.31%</b>	<b>7.82%</b>
<i>S&amp;P 500</i>		-4.38%	9.26%	8.49%	13.12%	6.11%
<b>U.S. Small/Mid Cap equity</b>	<b>55,907,180</b>	<b>-1.29%</b>	<b>10.09%</b>	<b>6.65%</b>	<b>15.01%</b>	<b>8.09%</b>
<i>Russell 2500</i>		-10.00%	7.32%	5.15%	13.15%	8.36%
<b>Non-U.S. equity</b>	<b>69,059,855</b>	<b>-11.06%</b>	<b>4.66%</b>	<b>1.93%</b>	<b>6.69%</b>	<b>8.16%</b>
<i>MSCI EAFE</i>		-13.36%	3.38%	1.00%	6.81%	7.07%
<b>Global equity</b>	<b>43,085,909</b>	<b>-6.40%</b>	<b>0.34%</b>	<b>1.79%</b>	<b>4.76%</b>	<b>2.60%</b>
<i>HFRI Equity Hedge</i>		-6.94%	3.60%	2.31%	5.67%	2.86%
<b>Private equity</b>	<b>20,428,681</b>	<b>4.89%</b>	<b>9.09%</b>	<b>10.09%</b>	n/a	<b>9.45%</b>
<i>S&amp;P 500</i>		-4.38%	9.26%	8.49%	13.12%	12.45%
<b>Fixed income</b>	<b>145,583,633</b>	<b>-0.18%</b>	<b>2.97%</b>	<b>1.65%</b>	<b>5.00%</b>	<b>4.73%</b>
<i>BloomBar US Aggregate</i>		0.01%	2.06%	2.52%	3.48%	4.00%
<b>Real estate</b>	<b>22,299,504</b>	<b>8.03%</b>	<b>7.87%</b>	<b>10.19%</b>	<b>5.73%</b>	<b>5.92%</b>
<i>NFI ODCE</i>		8.35%	8.24%	10.41%	6.94%	9.60%
<b>Cash and cash equivalents</b>	<b>2,152,623</b>	<b>1.71%</b>	<b>0.90%</b>	<b>0.58%</b>	n/a	<b>0.49%</b>
<b>Total Fund</b>	<b>\$ 484,328,030</b>	<b>-3.11%</b>	<b>5.68%</b>	<b>4.47%</b>	<b>9.19%</b>	<b>8.36%</b>
<i>Total Fund Policy Index **</i>		<b>-5.29%</b>	<b>6.44%</b>	<b>6.29%</b>	<b>9.77%</b>	<b>8.23%</b>

\* Certain investments have been reclassified for investment management purposes. As such, classifications may not agree with the audited financial statements.

\*\* Effective January 1, 2017, the index consists of 65% MSCI ACWI, 5% NFI ODCE, and 30% BloomBar US Aggregate. Prior to this date, it was comprised of 65% S&P 500 and 35% BloomBar US Aggregate.

Performance calculations in the above schedule were prepared using time-weighted rates of return.

**2018 Year in Review**

Despite ongoing central bank policy normalization and concerns around trade, the global economy extended its post-crisis recovery. The calm and resilience exhibited by financial markets in 2017 finally broke as global equity markets experienced multiple episodes of heightened volatility. Concerns of “peak growth” intensified throughout the year. Emerging market stocks served as the epicenter of risk, with a slowdown in China spreading to economies and markets throughout the world. With a strong risk-off rally late in the year, US bonds did well to finish flat or slightly up.

Cash outperformed both stocks and bonds as the Federal Reserve’s short-term rate increases finally restored positive real yields. Amid strong earnings momentum, the S&P 500 index was setting new all-time highs into late-September, before entering a major correction by year-end. The Russell 2000 index of small cap stocks shared a similar fate, ultimately experiencing double-digit losses. As such, valuations became more favorable throughout 2018.

Non-US markets underperformed US equities, with international developed markets (MSCI EAFE) and Emerging Markets (MSCI EM) down roughly 13% and 14%, respectively. Both were hindered by notable appreciation in the US dollar and concern around future growth prospects.

Bonds generated slightly positive total returns, having to overcome both rising US Treasury rates and wider credit spreads during 2018.

**Largest Equity Holdings (Non-Commingled Funds)**  
**December 31, 2018**

	Security	Fair Value	Shares
1)	Zoetis, Inc.	\$ 3,126,487	36,550
2)	Visa, Inc.	3,088,320	23,407
3)	Amazon.com, Inc.	3,035,481	2,021
4)	Intuitive Surgical, Inc.	2,806,950	5,861
5)	PayPal Holdings, Inc.	2,712,491	32,257
6)	Cisco Systems Inc.	2,681,737	61,891
7)	Intuit, Inc.	2,662,593	13,526
8)	JPMorgan Chase & Co.	2,557,644	26,200
9)	Salesforce.com, Inc.	2,542,437	18,562
10)	Thermo Fischer Scientific, Inc.	2,541,359	11,356

*Note: A complete list of holdings is available upon request.*

**Schedule of Advisor Fees**  
**For the Year Ended December 31, 2018**

Investment management expenses	
Domestic stocks	\$ 1,228,498
International stocks	534,614
Bonds	144,321
Private equity	196,934
Real estate	<u>217,201</u>
Total investment management expenses	<u>2,321,568</u>
Other investment expenses	
Investment consultants	253,895
Investment custodian	121,451
Bank depository	<u>1,092</u>
Total other investment expenses	<u>376,438</u>
Total investment expenses	<u><u>\$ 2,698,006</u></u>

**Schedule of Brokerage Commissions**  
**For the Year Ended December 31, 2018**

Broker name	Shares	Commissions	Per Share
TCW	725,861	\$ 28,775	0.04
Brown Advisory	350,888	8,897	0.03
William Blair	497,748	13,137	0.03
Burgundy Asset Management	966,632	10,481	0.01
Total commissions	<u>2,541,129</u>	<u>\$ 61,290</u>	<u>\$ 0.10</u>

# ACTUARIAL SECTION





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## Actuary's Certification Letter

June 6, 2019

The Board of Trustees  
County Employees' Retirement Fund  
2121 Schotthill Woods Drive  
Jefferson City, MO 65101

We conducted the annual actuarial valuation of the County Employees' Retirement Fund (CERF) as of January 1, 2018, for assessing plan funded status and calculating the actuarially determined contribution for the 2018 plan year. The major findings of the valuation are contained in an actuarial valuation report dated June 1, 2018.

In preparing that report, we relied, without audit, on information supplied by CERF and Williams Keepers, LLC. This information includes, but is not limited to, statutory provisions, member census data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

Actuarial assumptions, including discount rates, mortality tables, and others identified in this report, and actuarial cost methods are prescribed by CERF's Board. These parties are responsible for selecting the plan's funding policy, actuarial valuation methods, asset valuation methods, and assumptions. The policies, methods and assumptions used in this valuation are those that have been so prescribed and are described in the Actuarial Basis of this report. In our opinion the assumptions and methods used in this report meet the requirements of the Actuarial Standards of Practice. The System is solely responsible for communicating to Milliman any changes required thereto.

The valuation report is only an estimate of the Systems' financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While the valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct.



Actuarial computations presented in this report are for purposes of determining the recommended funding amounts for the System. The calculations in the valuation report have been made on a basis consistent with our understanding of the System's funding requirements and goals.

Milliman's work is prepared solely for the use and benefit of the County Employees' Retirement Fund ("System"). No third party of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

In addition to the annual actuarial valuation report, a separate report is issued to provide financial reporting information in accordance with Governmental Accounting Standards Board (GASB) Statement Nos. 67 and 68.

The following schedules in the Actuarial Section of the CAFR were prepared based upon certain information presented in the previously mentioned funding and financial reporting valuation reports:

Summary of Actuarial Methods and Assumptions	Schedule of Active Member Data
Retirees and Beneficiaries Added and Removed	Schedule of Funding Progress
Financial Experience Analysis	Short-Term Solvency Test
Summary of Plan Provisions	

The consultants who worked on this assignment are pension actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

A handwritten signature in black ink, appearing to read "Michael Zwiener".

Michael Zwiener, FSA, EA  
Consulting Actuary

A handwritten signature in black ink, appearing to read "William D. Winningham".

William D. Winningham, EA  
Consulting Actuary

MJZ/WDW/giy

The defined benefit pension actuarial information presented in this *2018 Comprehensive Annual Financial Report* (CAFR) is based on CERF's most current actuarial valuation data as of December 31, 2018. The Financial Section of the CAFR presents additional actuarial valuation information on a financial reporting basis, or accounting basis, as required by GASB 67. This section presents actuarial valuation information on a funding basis, and has been updated to reflect pension funding results as of December 31, 2018. The actuarial assumptions in this section are applicable to 2018, unless otherwise noted.

### **Summary of Actuarial Methods and Assumptions**

Actuarial cost method: Entry age cost method. Entry age is the age of the members' hire date. Normal cost and accrued liability are calculated on an individual basis and are based on costs allocated as a level percent of compensation, as if the current benefit formulas have always been in effect.

Amortization method: Layered, level percent of payroll. The Unfunded Actuarial Liability (UAL) is amortized as a level percentage of projected payroll in an effort to maintain level contribution rates as a percentage of payroll during the specified amortization period if future experience follows the assumption.

New UAL arises each year when each new actuarial valuation is published. The newly arising UAL can be either positive or negative, and can be due either to experience varying from assumption or to changes in actuarial liability from modifications to assumptions, plan provisions or actuarial methods. Each year's newly arising UAL is currently amortized over a closed 20-year period as a level percent of the projected payroll.

Amortization period: 20 years

Amortization growth rate: 2.5%

Asset valuation method: To the extent actual investment performance differs from the assumed rate of return, such differences are taken into account systematically as follows:

The actuarial value of assets was determined using the expected return method. Under this method, the gain or loss for a year is the difference between the expected value of assets for the year and the market value. The expected value is the market value brought forward one year at the assumed rate of return with appropriate adjustments for contributions and disbursements. The actuarial value of assets is equal to the market value of assets, with the gains and losses deferred as follows:

- i. 80% of the prior year gain/loss
- ii. 60% of the second preceding year's gain/loss
- iii. 40% of the third preceding year's gain/loss
- iv. 20% of the fourth preceding year's gain/loss

To ensure that the actuarial value of assets remains reasonably close to the market value of assets, the asset method includes a corridor whereby the actuarial value of assets must remain within 80% to 120% of the market value of assets.

Actuarial assumptions:

Investment rate of return:	7.5%, net of investment expenses
Inflation:	2.5%
Compensation increases:	2.5%, plus merit
Cost of living adjustments:	1.0% per annum, 50% cap on initial benefit
Mortality rates:	RP-2000 combined mortality projected to 2022 using scale BB
Retirement age:	Rates vary by age as shown below

Retirement	
Age	Rate
< 55	0.00
55	0.05
56	0.05
57	0.05
58	0.05
59	0.05
60	0.10
61	0.15
62	0.25
63	0.18
64	0.18
65	0.25
66	0.15
67	0.15
68	0.15
69	0.15
70	1.00

Turnover:	Select and ultimate rates based on age and service as shown below
-----------	---

Select rate during the first 4 years of employment:

Years of Service	Non-LAGERS	LAGERS
0	0.30	0.30
1	0.25	0.25
2	0.20	0.20
3	0.18	0.15
4	0.15	0.12

Ultimate rate for members with more than 4 years of service:

Withdrawal											
Males and Females											
Non-LAGERS											
Age	5-7 Yrs	8+ Yrs	Age	5-7 Yrs	8+ Yrs	Age	5-7 Yrs	8+ Yrs	Age	5-7 Yrs	8+ Yrs
<=19	0.00	0.00	32	0.16	0.11	45	0.10	0.07	58	0.08	0.07
20	0.25	0.19	33	0.15	0.10	46	0.10	0.06	59	0.08	0.07
21	0.24	0.18	34	0.14	0.10	47	0.09	0.06	60	0.08	0.07
22	0.23	0.17	35	0.14	0.10	48	0.09	0.06	61	0.09	0.07
23	0.22	0.16	36	0.13	0.09	49	0.09	0.06	62	0.09	0.08
24	0.21	0.16	37	0.13	0.09	50	0.09	0.06	63	0.09	0.08
25	0.21	0.15	38	0.12	0.08	51	0.09	0.06	64	0.09	0.08
26	0.20	0.14	39	0.12	0.08	52	0.08	0.06	65	0.09	0.09
27	0.19	0.14	40	0.12	0.08	53	0.08	0.06	66	0.10	0.09
28	0.18	0.13	41	0.11	0.07	54	0.08	0.06	67	0.10	0.10
29	0.18	0.13	42	0.11	0.07	55	0.08	0.06	68	0.10	0.10
30	0.17	0.12	43	0.10	0.07	56	0.08	0.07	69	0.10	0.10
31	0.16	0.11	44	0.10	0.07	57	0.08	0.07	>= 70	0.11	0.11

Withdrawal											
Males and Females											
LAGERS											
Age	5-7 Yrs	8+ Yrs	Age	5-7 Yrs	8+ Yrs	Age	5-7 Yrs	8+ Yrs	Age	5-7 Yrs	8+ Yrs
<=19	0.00	0.00	32	0.13	0.09	45	0.07	0.06	58	0.08	0.06
20	0.23	0.16	33	0.12	0.09	46	0.07	0.05	59	0.08	0.06
21	0.22	0.15	34	0.11	0.08	47	0.07	0.05	60	0.08	0.07
22	0.21	0.15	35	0.11	0.08	48	0.07	0.05	61	0.08	0.07
23	0.20	0.14	36	0.10	0.08	49	0.07	0.05	62	0.09	0.07
24	0.19	0.13	37	0.10	0.07	50	0.07	0.05	63	0.09	0.08
25	0.18	0.13	38	0.09	0.07	51	0.07	0.05	64	0.10	0.08
26	0.17	0.12	39	0.09	0.07	52	0.07	0.05	65	0.10	0.08
27	0.16	0.12	40	0.09	0.06	53	0.07	0.05	66	0.11	0.09
28	0.16	0.11	41	0.08	0.06	54	0.07	0.06	67	0.11	0.09
29	0.15	0.11	42	0.08	0.06	55	0.07	0.06	68	0.12	0.09
30	0.14	0.10	43	0.08	0.06	56	0.07	0.06	69	0.13	0.10
31	0.13	0.10	44	0.07	0.06	57	0.07	0.06	>= 70	0.13	0.10

## Schedule of Active Member Valuation Data

Valuation Date	Number of Members	Annual Payroll	Average Annual Salary	% Increase	Average Age	Average Years of Service
12/31/2018	11,616	\$ 433,125,201	\$ 37,287	3.5%	44.9	8.3
12/31/2017	11,500	414,454,785	36,040	1.6%	45.0	8.4
12/31/2016	11,303	401,037,836	35,481	2.2%	45.2	8.7
12/31/2015	11,291	391,801,920	34,700	2.7%	45.3	8.7
12/31/2014	11,010	372,165,232	33,802	1.7%	45.3	9.1
7/1/2013	10,891	361,898,865	33,229	2.1%	45.6	9.1
7/1/2012	10,987	357,441,466	32,533	1.2%	45.4	8.9
7/1/2011	11,010	353,991,192	32,152	0.0%	45.2	8.8
7/1/2010	11,237	361,334,336	32,156	1.9%	45.1	8.5
7/1/2009	11,173	352,719,824	31,569	3.7%	44.7	8.2

## Retirees and Beneficiaries Added and Removed

Fiscal Year	Number of Retired Members and Beneficiaries		Annual Benefit of Retired Members and Beneficiaries		Total Number of Retired Members and Beneficiaries	Total Annual Benefit	Percentage Increase in Total Annual Benefits	Average Annual Benefit
	Added During the Year	Removed During the Year	Added During the Year	Removed During the Year				
2018	347	136	\$ 2,468,400	\$ 759,108	5,321	\$ 33,017,109	6.91%	\$ 6,205
2017	476	152	3,469,824	776,892	5,086	30,881,826	9.60%	6,072
2016	329	117	2,069,760	578,325	4,774	28,175,645	6.48%	5,902
2015	376	114	3,025,143	533,604	4,519	26,460,002	10.48%	5,855
2014	334	96	2,644,864	562,560	4,303	23,950,417	8.57%	5,566
2013	439	111	3,712,765	730,599	3,669	22,059,430	10.04%	6,012
2012	325	82	2,448,310	394,302	3,443	20,047,115	8.31%	5,823
2011	396	78	3,620,281	349,898	3,135	18,508,288	15.40%	5,904
2010	286	64	2,371,671	286,190	2,940	16,038,186	9.17%	5,455
2009	385	62	2,949,541	329,675	2,616	14,691,234	13.53%	5,616

## Employer Schedule of Funding Progress

CERF uses the entry-age normal funding method. The entry-age normal actuarial cost method allocates the actuarial present value of each member's projected benefits on a level basis over the member's pensionable compensation between the entry age of the member and assumed exit ages.

Actuarial Valuation Date	Actuarial						UAAL as a % of Covered Payroll
	Actuarial Value of Assets	Accrued Liability (AAL) Entry Age	Unfunded AAL (UAAL)	Funded Ratio	Covered Payroll		
6/30/2009	\$ 270,397,854	\$ 396,537,305	\$ 126,139,451	68.2%	\$ 352,719,824		35.8%
6/30/2010	294,482,927	423,561,319	129,078,392	69.5%	361,334,336		35.7%
6/30/2011	318,320,084	452,366,458	134,046,374	70.4%	353,991,192		37.9%
6/30/2012	331,189,281	482,565,132	151,375,851	68.6%	357,441,466		42.3%
6/30/2013	360,289,802	511,278,478	150,988,676	70.5%	361,898,865		41.7%
12/31/2014	422,283,987	593,982,414	171,698,427	71.1%	372,165,232		46.1%
12/31/2015 *	448,784,038	640,399,679	191,615,641	70.1%	391,801,920		48.9%
12/31/2016	477,065,373	672,625,878	195,560,505	70.9%	401,037,836		48.8%
12/31/2017	507,132,934	706,804,505	199,671,571	71.8%	414,454,785		48.2%
12/31/2018	529,029,220	748,838,283	219,809,063	70.6%	433,125,201		50.7%

\* New assumptions and/or methods adopted

## Financial Experience

Actual experience will never coincide exactly with assumed experience (except by coincidence). Gains and losses may offset each other over a period of years, but sizeable year-to-year variations from assumed experience are common. Detail on the analysis of the financial experience gain (loss) is shown below.

UAAL Beginning of Year at January 1, 2018	\$ 199,671,571
Normal Cost	22,711,292
Contributions (net 401(a) match)	(40,517,040)
Interest	15,186,794
Change in UAAL due to Actuarial Assumption Changes	-
Change in UAAL due to Plan Amendment	-
Expected UAAL as of December 31, 2018	197,052,617
Actual UAAL as of December 31, 2018	219,809,063
Gain/(Loss) for Plan Year Ending December 31, 2018	(22,756,446)

## Short-Term Solvency Test

Actuarial Valuation Date	Actuarial Accrued Liability for:			Actuarial Value of Assets	Percentage of Actuarial Liabilities Covered by Net Assets for:			
	Member Contributions	Retirees and Beneficiaries	Inactive Members		(1)	(2)	(3)	Total
	(1)	(2)	(3)					
6/30/2009	\$ -	\$ 127,191,071	\$ 269,346,234	\$ 270,397,854	100%	100%	53.2%	68.2%
6/30/2010	-	144,396,614	279,164,705	294,482,927	100%	100%	53.8%	69.5%
6/30/2011	-	152,989,362	299,377,096	318,320,084	100%	100%	55.2%	70.4%
6/30/2012	-	175,934,134	306,630,998	331,189,281	100%	100%	50.6%	68.6%
6/30/2013	-	188,843,433	322,435,045	360,289,802	100%	100%	53.2%	70.5%
12/31/2014	-	221,786,947	372,195,467	422,283,987	100%	100%	53.9%	71.1%
12/31/2015 *	-	255,947,474	384,452,205	448,784,038	100%	100%	50.2%	70.1%
12/31/2016	-	270,475,166	402,150,712	477,065,373	100%	100%	51.4%	70.9%
12/31/2017	-	302,124,758	404,679,747	507,132,934	100%	100%	50.7%	71.8%
12/31/2018	-	320,463,405	428,374,878	529,029,220	100%	100%	48.7%	70.6%

\* New assumptions and/or methods adopted

## Summary of Plan Provisions

Summarized below are the major provisions of CERF, as established by Sections 50.1000-50.1300 of the Missouri Revised Statutes (RSMo).

### *Eligibility*

CERF is a mandatory cost-sharing multiple employer retirement system for each county in the state of Missouri, except any city not within a county (which excludes the City of St. Louis) and counties of the first classification with a charter form of government, other than any county adopting a charter form of government after January 1, 2008. CERF covers county elective or appointive officers or employees whose position requires the actual performance of duties not less than 1,000 hours per year; including employees of circuit courts located in a first class, non-charter county which is not participating in the Local Government Employees Retirement System (LAGERS); and does not cover circuit clerks, deputy circuit clerks, county prosecuting attorneys, and county sheriffs. Until January 1, 2000, employees hired before January 1, 2000 could opt out of the system.

### *Contributions*

Member contributions are required, the amount of which is based on the member's most recent date of hire as well as if the member is also participating in LAGERS. The amount of the required member contribution is summarized in the table below:

<u>Most Recent Date of Hire</u>	Percent of Compensation	
	<u>Non-LAGERS</u>	<u>LAGERS</u>
Before February 25, 2002	2.0%	0.0%
On or After February 25, 2002	6.0%	4.0%

Employer contributions are a combination of taxes, fees, and penalties as provided by Statute 50.1020. In addition, some counties have elected to contribute a portion of or all of the required member contribution up to 4% for employees hired on or after February 25, 2002, in lieu of payroll deductions. Nearly all of the funding for CERF comes from county receipts in the form of contributions, fees and penalties.

#### *Vesting*

A participant is vested after eight years of continuous creditable service during which pay is earned and received for at least 1,000 hours in each of those eight years.

#### *Prior Service*

Employees who were employed on June 10, 1999, and remained employed through January 1, 2000, do not have to purchase prior service. Members who terminated vested or retired prior to January 1, 2000, must purchase any service accrued prior to August 28, 1994, in order to include that service in their retirement benefit.

#### *Average Final Compensation*

Average final compensation represents the average of the two highest years of compensation from the county. Lump sum payments for unused sick leave, unused vacation, and other types of back pay attributed to prior years of employment are excluded from the calculation of average final compensation.

#### *Early Retirement*

Members have the option of retiring as early as age 55 (with eight years of continuous creditable service) and receiving an actuarially-reduced benefit. To be eligible for early retirement, a participant must terminate employment on or after January 1, 2000, and meet other eligibility requirements.

#### *Normal Retirement Eligibility*

Participants are eligible to retire at age 62 with eight years of credited service.

The Normal Retirement Benefit is the greater of A, B, and C below:

- A) Frozen Minimum Benefit as of 12/31/1999
- B) Flat \$29 per month times years of Credited Service (maximum of 29 years)
- C) Replacement Ratio Formula (i + ii as defined below)
  - i) Average Final Compensation times the replacement ratio from the table below minus the age 62 Social Security Primary Insurance Amount. The result is then multiplied by service (up to 25 years) and divided by 25.
  - ii) Average Final Compensation times 1% times service in excess of 25 years but no more than 29 years.

<b>Average Final Compensation</b>	<b>Replacement Ratio</b>
\$36,000 or less	80%
\$36,000.01 - \$48,000	77%
Over \$48,000	72%

### *Survivor Benefits*

Active employees: If a participant dies while actively employed, his or her named beneficiary will receive a lump-sum death benefit of \$10,000.

Non-vested members: Senate Bill 625, effective August 28, 2012, allows a refund of contributions to the beneficiary(ies) of active members who die after December 31, 2002, and before becoming vested.

Married, vested members: If a vested participant dies before his or her pension begins, his or her surviving spouse can apply for a 50% spousal pension benefit.

Single, vested members: House Bill 795, effective August 28, 2004, allows a refund of contributions to the beneficiary(ies) of a single, vested member who dies on or after August 28, 2004.

Retired members: Depending on which option the member chooses, the designated survivor will receive the appropriate amount of benefits under the survivor option selected on his or her benefit calculation. Members who terminated employment or retired on or after January 1, 2000, have the option to designate someone other than a spouse as the beneficiary of their retirement annuity.

# STATISTICAL SECTION



# Statistical Summary

The objectives of the statistical section are to provide additional historical perspective, context, and relevant details to assist readers in using information in the financial statements, notes to the financial statements, and required supplementary information in order to understand and assess CERF's overall financial condition. All non-accounting data in this section was derived from internal sources and the annual actuarial valuation reports.

The schedules and graphs beginning on page 52 show financial trend information about the change in CERF's financial position for the past 10 years. The financial trend schedules presented are:

- Change in Fiduciary Net Position
- County Fee Receipts
- Schedule of Contributions
- Benefits Paid
- Comparison of Actuarial Assets and Total Actuarial Liabilities

The schedules and graphs beginning on page 57 show demographic and economic information of CERF's membership. This data includes the number of members, average compensation, average age, and average monthly benefits.

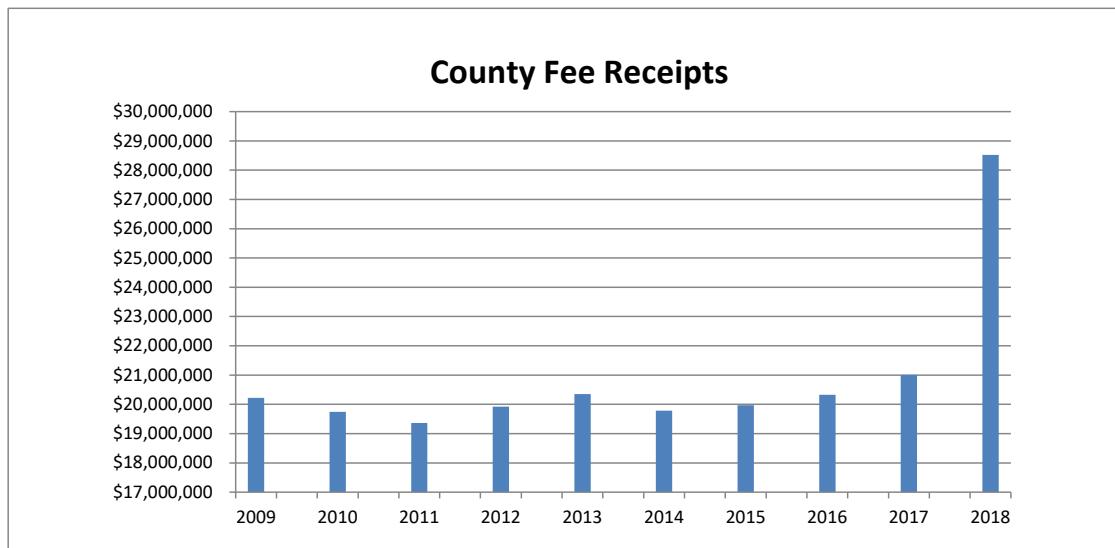
The map on page 60 reflects the 2018 payments made to retirees and beneficiaries by county. The map identifies all the counties in Missouri that are participating employers in CERF.

**County Employees' Retirement Fund**  
**Statements of Changes in Fiduciary Net Position**  
**Last Ten Fiscal Years**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Additions:</b>										
County receipts	\$ 20,224,734	\$ 19,739,918	\$ 19,364,023	\$ 19,919,125	\$ 20,348,888	\$ 19,781,514	\$ 19,968,537	\$ 20,329,625	\$ 21,006,080	\$ 28,517,335
Member contributions	8,335,338	8,405,810	8,929,581	9,412,122	10,034,205	10,599,321	11,519,437	11,588,772	12,366,187	13,303,261
Member contributions, paid by counties	783,752	1,078,475	1,032,000	1,150,772	1,063,647	1,235,779	1,517,407	2,142,332	1,977,497	2,300,484
Other contributions and income	215,867	79,666	86,155	88,926	104,316	70,024	83,849	73,942	78,684	103,387
Net investment income (loss)	47,842,927	36,938,011	(1,593,844)	40,515,139	67,381,460	17,958,335	94,626	21,566,708	64,590,498	(16,382,467)
<b>Total additions</b>	<b>77,402,618</b>	<b>66,241,880</b>	<b>27,817,915</b>	<b>71,086,084</b>	<b>98,932,516</b>	<b>49,644,973</b>	<b>33,183,856</b>	<b>55,701,379</b>	<b>100,018,946</b>	<b>27,842,000</b>
<b>Deductions:</b>										
Retirement benefits	14,999,256	16,246,166	18,825,068	20,273,110	22,368,902	24,242,805	26,758,453	28,423,305	31,129,540	33,439,139
Refunds of member contributions	2,545,500	2,616,254	3,316,811	3,185,425	3,658,100	3,169,101	3,142,804	3,037,078	3,678,904	3,810,029
Defined contribution plan matching contribution	2,005,611	2,126,632	2,224,641	2,472,044	2,531,548	2,696,164	2,861,751	3,133,484	3,200,949	3,698,619
Administrative expense	1,919,044	1,841,979	1,917,436	1,964,117	2,089,424	2,130,636	2,522,685	2,841,954	3,249,395	3,121,552
<b>Total deductions</b>	<b>21,469,411</b>	<b>22,831,031</b>	<b>26,283,956</b>	<b>27,894,696</b>	<b>30,647,974</b>	<b>32,238,706</b>	<b>35,285,693</b>	<b>37,435,821</b>	<b>41,258,788</b>	<b>44,069,339</b>
<b>Change in fiduciary net position</b>	<b>\$ 55,933,207</b>	<b>\$ 43,410,849</b>	<b>\$ 1,533,959</b>	<b>\$ 43,191,388</b>	<b>\$ 68,284,542</b>	<b>\$ 17,406,267</b>	<b>\$ (2,101,837)</b>	<b>\$ 18,265,558</b>	<b>\$ 58,760,158</b>	<b>\$ (16,227,339)</b>

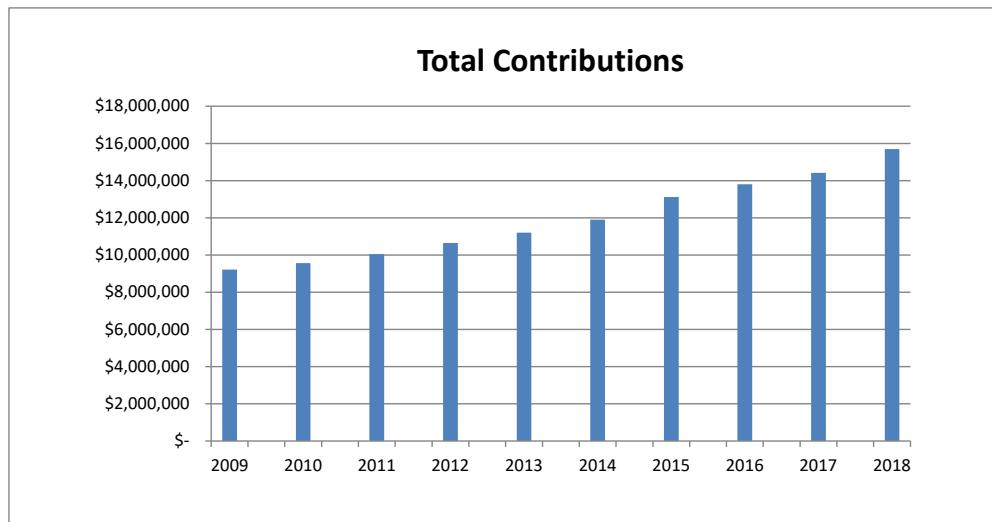
**County Employees' Retirement Fund**  
**County Fee Receipts**  
**Last Ten Fiscal Years**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Delinquent property tax fees	\$ 8,171,265	\$ 8,202,492	\$ 8,039,013	\$ 7,798,546	\$ 8,056,301	\$ 8,055,102	\$ 7,916,205	\$ 7,792,473	\$ 8,141,782	\$ 13,827,358
Assessor late assessment filing fees	5,264,998	5,234,220	5,230,653	5,500,327	5,762,731	5,874,232	6,066,688	6,472,823	6,851,017	7,767,778
Recorder document fees	5,560,869	5,120,560	4,898,134	5,478,788	5,376,260	4,657,422	4,857,464	4,955,962	4,890,231	4,843,494
Merchants licenses fees	1,168,839	1,123,795	1,142,799	1,086,122	1,093,740	1,133,720	1,069,838	1,046,869	1,057,071	1,042,619
Delinquent land list fees	-	-	-	-	-	-	-	-	-	948,285
Interest on above fees	58,763	58,851	53,424	55,342	59,856	61,038	58,342	61,498	65,979	87,801
<b>Total</b>	<b>\$ 20,224,734</b>	<b>\$ 19,739,918</b>	<b>\$ 19,364,023</b>	<b>\$ 19,919,125</b>	<b>\$ 20,348,888</b>	<b>\$ 19,781,514</b>	<b>\$ 19,968,537</b>	<b>\$ 20,329,625</b>	<b>\$ 21,006,080</b>	<b>\$ 28,517,335</b>



**County Employees' Retirement Fund**  
**Schedule of Contributions**  
**Last Ten Fiscal Years**

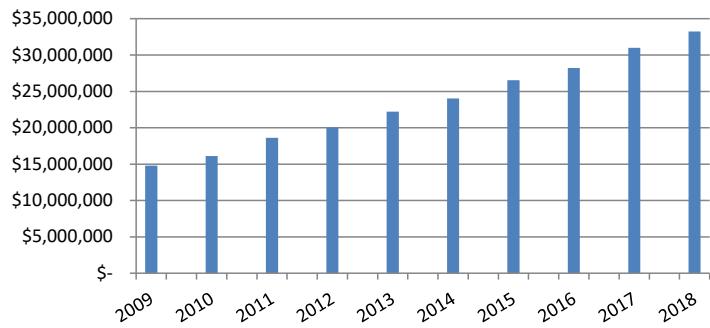
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Member contributions	\$ 8,335,338	\$ 8,405,810	\$ 8,929,581	\$ 9,412,122	\$ 10,034,205	\$ 10,599,321	\$ 11,519,437	\$ 11,588,772	\$ 12,366,187	\$ 13,303,261
Member contributions, paid by counties	783,752	1,078,475	1,032,000	1,150,772	1,063,647	1,235,779	1,517,407	2,142,332	1,977,497	2,300,484
Member contributions, purchase of prior service	92,669	75,165	81,043	85,145	100,398	64,832	78,904	68,655	72,243	94,579
	<u>\$ 9,211,759</u>	<u>\$ 9,559,450</u>	<u>\$ 10,042,624</u>	<u>\$ 10,648,039</u>	<u>\$ 11,198,250</u>	<u>\$ 11,899,932</u>	<u>\$ 13,115,748</u>	<u>\$ 13,799,759</u>	<u>\$ 14,415,927</u>	<u>\$ 15,698,324</u>



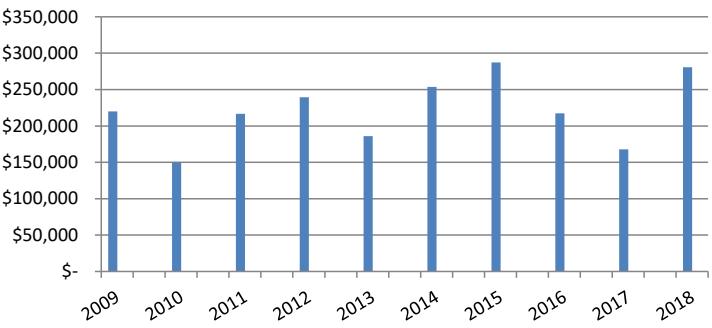
**County Employees' Retirement Fund**  
**Benefits Paid**  
**Last Ten Fiscal Years**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Normal retirement benefits	\$ 13,768,546	\$ 14,980,781	\$ 17,421,069	\$ 18,701,715	\$ 20,725,606	\$ 22,352,319	\$ 24,695,932	\$ 26,165,898	\$ 28,731,165	\$ 30,717,503
Survivor retirement benefits	1,010,710	1,115,385	1,193,999	1,345,403	1,479,288	1,660,486	1,824,522	2,047,407	2,258,375	2,501,636
Death benefits	220,000	150,000	210,000	225,992	164,000	230,000	250,000	210,000	162,000	220,000
Single vested death benefits *	-	-	6,616	13,426	22,037	23,636	37,131	7,404	5,768	60,816
<b>Total</b>	<b>\$ 14,999,256</b>	<b>\$ 16,246,166</b>	<b>\$ 18,831,684</b>	<b>\$ 20,286,536</b>	<b>\$ 22,390,931</b>	<b>\$ 24,266,441</b>	<b>\$ 26,807,585</b>	<b>\$ 28,430,709</b>	<b>\$ 31,157,308</b>	<b>\$ 33,499,955</b>

**Retirement & Survivor Benefit Payments**



**Death & Single Vested Benefit Payments**

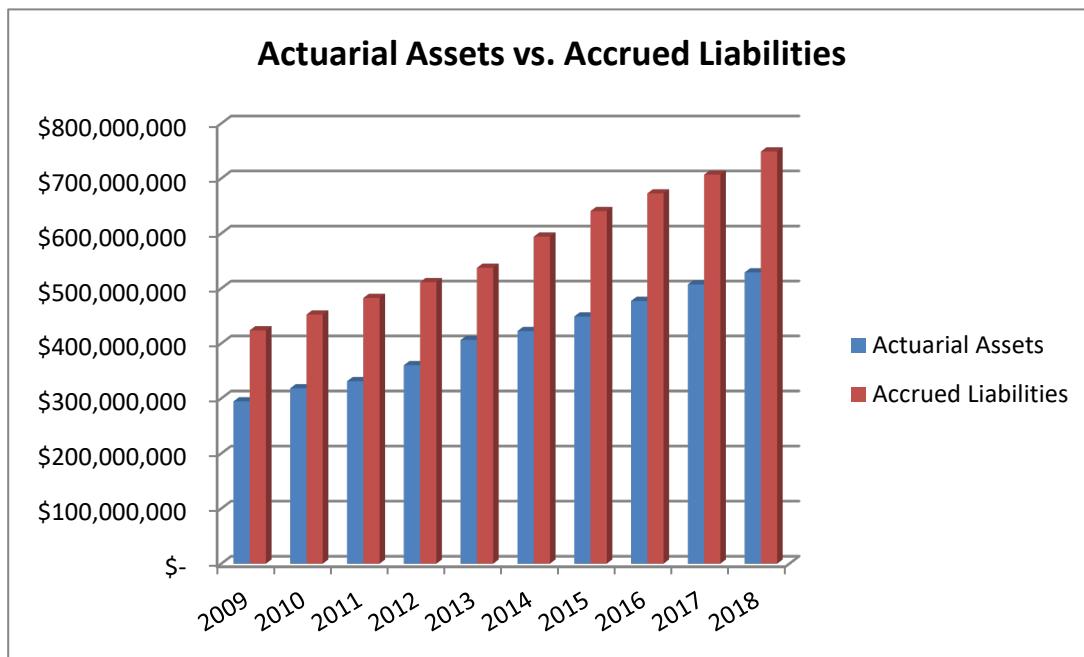


*Note:* All benefit amounts above are reflected at gross.

\* Single vested death benefits are recorded as refunds of member contributions on the Statements of Changes in Fiduciary Net Position.

**County Employees' Retirement Fund**  
**Comparison of Actuarial Assets and Total Actuarial Liabilities**  
**Last Ten Fiscal Years**

Fiscal Year	Actuarial Assets	Unfunded Liabilities	Accrued Liabilities	Funded Ratios
2009	\$ 294,482,927	\$ 129,078,392	\$ 423,561,319	69.5%
2010	318,320,084	134,046,374	452,366,458	70.4%
2011	331,189,281	151,375,851	482,565,132	68.6%
2012	360,289,802	150,988,676	511,278,478	70.5%
2013	406,209,618	131,165,166	537,374,784	75.6%
2014	422,283,987	171,698,427	593,982,414	71.1%
2015	448,784,038	191,615,641	640,399,679	70.1%
2016	477,065,373	195,560,505	672,625,878	70.9%
2017	507,132,934	199,671,571	706,804,505	71.8%
2018	529,029,220	219,809,063	748,838,283	70.6%



**County Employees' Retirement Fund**  
**Average Monthly Benefit Payments**  
**Last Ten Fiscal Years**

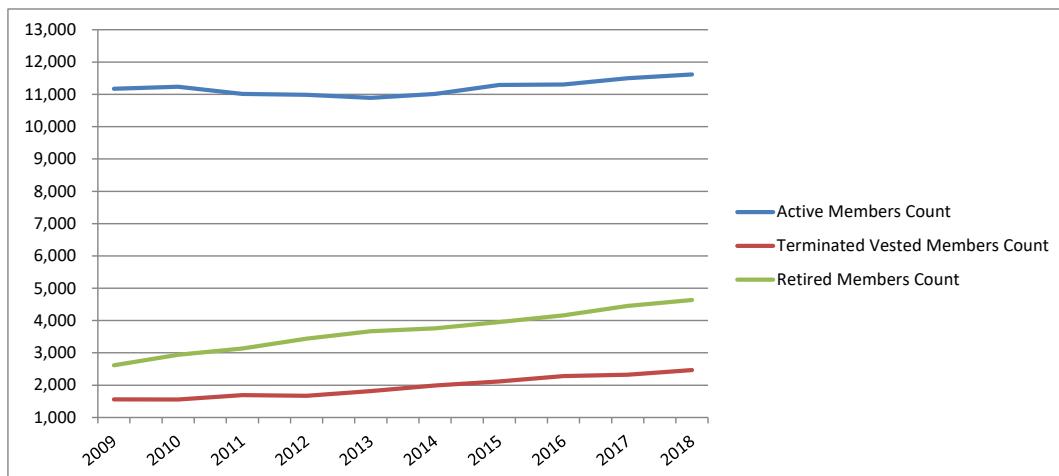
	Years of Service					
	5-10	11-15	16-20	21-25	26-30	31 +
<b>2018</b>						
Average monthly benefit	\$ 243	\$ 372	\$ 546	\$ 700	\$ 816	\$ 766
Average final average salary	\$ 27,506	\$ 29,166	\$ 33,638	\$ 37,507	\$ 40,434	\$ 52,549
Number of retirees	949	1,254	1,178	745	541	736
<b>2017</b>						
Average monthly benefit	\$ 242	\$ 366	\$ 542	\$ 684	\$ 811	\$ 748
Average final average salary	\$ 27,021	\$ 28,679	\$ 33,217	\$ 36,848	\$ 39,974	\$ 51,413
Number of retirees	921	1,222	1,132	707	520	689
<b>2016</b>						
Average monthly benefit	\$ 239	\$ 362	\$ 527	\$ 654	\$ 769	\$ 721
Average final average salary	\$ 26,610	\$ 28,130	\$ 32,773	\$ 36,289	\$ 39,824	\$ 51,493
Number of retirees	863	1,120	1,052	664	474	643
<b>2015</b>						
Average monthly benefit	\$ 237	\$ 364	\$ 513	\$ 638	\$ 768	\$ 711
Average final average salary	\$ 26,118	\$ 27,799	\$ 32,493	\$ 35,906	\$ 40,049	\$ 51,810
Number of retirees	809	1,050	1,006	641	463	619
<b>2014</b>						
Average monthly benefit	\$ 237	\$ 356	\$ 506	\$ 620	\$ 730	\$ 685
Average final average salary	\$ 25,705	\$ 27,335	\$ 32,176	\$ 35,435	\$ 38,925	\$ 50,343
Number of retirees	763	983	938	603	419	584
<b>2013</b>						
Average monthly benefit	\$ 231	\$ 356	\$ 493	\$ 609	\$ 724	\$ 680
Average final average salary	\$ 25,504	\$ 26,811	\$ 31,831	\$ 35,181	\$ 37,702	\$ 48,751
Number of retirees	709	927	910	574	399	555
<b>2012</b>						
Average monthly benefit	\$ 224	\$ 340	\$ 477	\$ 588	\$ 702	\$ 662
Average final average salary	\$ 25,008	\$ 26,071	\$ 31,622	\$ 34,679	\$ 37,733	\$ 48,453
Number of retirees	646	827	840	541	360	520
<b>2011</b>						
Average monthly benefit	\$ 222	\$ 333	\$ 475	\$ 578	\$ 695	\$ 646
Average final average salary	\$ 24,594	\$ 25,674	\$ 31,195	\$ 33,641	\$ 37,444	\$ 47,791
Number of retirees	601	775	782	510	345	491
<b>2010</b>						
Average monthly benefit	\$ 217	\$ 332	\$ 450	\$ 559	\$ 653	\$ 617
Average final average salary	\$ 24,008	\$ 25,020	\$ 30,319	\$ 32,922	\$ 36,331	\$ 46,704
Number of retirees	559	725	704	457	310	439
<b>2009</b>						
Average monthly benefit	\$ 217	\$ 323	\$ 451	\$ 542	\$ 628	\$ 622
Average final average salary	\$ 23,808	\$ 24,481	\$ 29,829	\$ 31,561	\$ 35,394	\$ 45,878
Number of retirees	525	671	649	430	292	415

**County Employees' Retirement Fund**  
**Member Data**  
**Last Ten Fiscal Years**

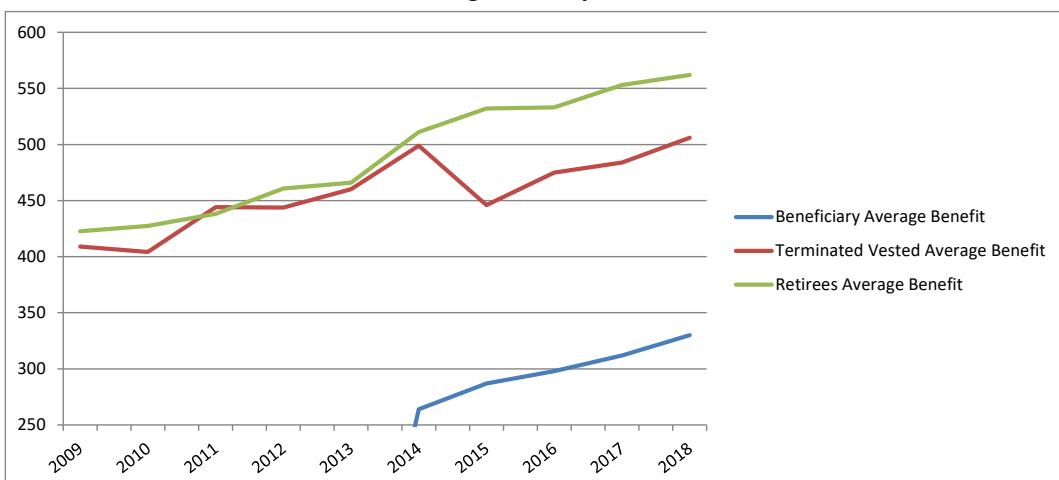
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Active Members</b>										
Count	11,173	11,237	11,010	10,987	10,891	11,010	11,291	11,303	11,500	11,616
Average Compensation	\$31,569	\$32,156	\$32,152	\$32,533	\$33,229	\$33,802	\$34,700	\$35,481	\$36,040	\$37,287
Average Age	44.7	45.1	45.2	45.4	45.6	45.3	45.3	45.2	45.0	44.9
Average Service	8.2	8.5	8.8	8.9	9.1	9.1	8.7	8.7	8.4	8.3
<b>Terminated Vested Members</b>										
Count	1,564	1,557	1,696	1,672	1,815	1,991	2,115	2,280	2,324	2,468
Average Age	50.1	49.3	50.2	50.2	50.3	49.8	49.2	50.1	49.5	50.1
Average Monthly Benefits	\$409	\$404	\$444	\$444	\$460	\$499	\$446	\$475	\$484	\$506
<b>Retired Members</b>										
Count	2,616	2,940	3,135	3,443	3,669	3,761	3,951	4,163	4,454	4,636
Average Age	70.0	70.0	70.1	70.2	70.3	71.0	71.2	71.4	71.4	71.6
Average Monthly Benefits	\$423	\$427	\$438	\$461	\$466	\$511	\$532	\$533	\$553	\$562
<b>Beneficiaries</b>										
Count	***	***	***	***	***	542	568	611	632	685
Average Age	***	***	***	***	***	69.8	71.2	71.5	71.9	71.9
Average Monthly Benefits	***	***	***	***	***	\$264	\$287	\$298	\$312	\$330

\*\*\*: Until the January 1, 2015 valuations, beneficiary information is included within the retired members section.

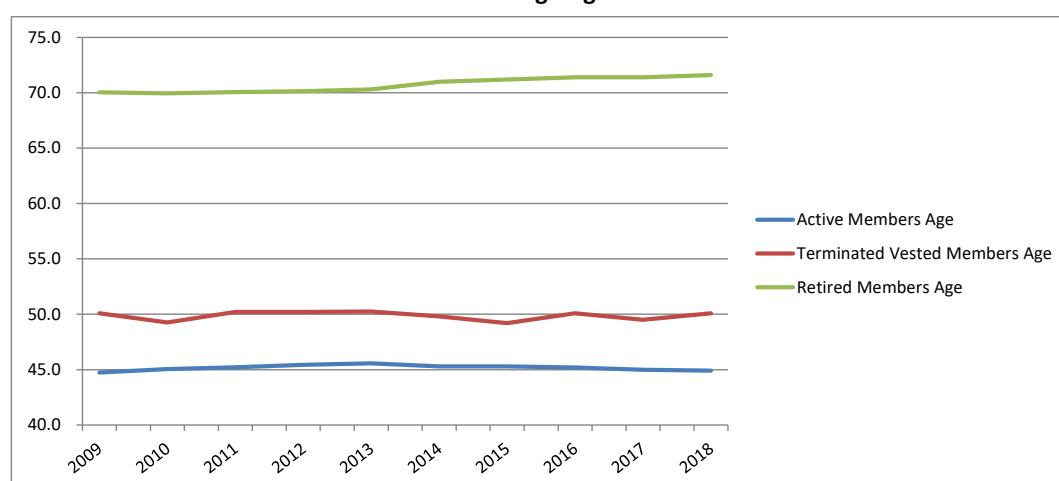
### Growth in Membership



### Average Monthly Benefit



### Average Age



**CERF**  
2018 Retiree and Beneficiary Payouts by County

>\$1,000,000	\$500,000 - \$999,999	\$250,000 - \$499,999	\$100,000 - \$249,999	\$1 – \$99,999	Non-CERF Counties
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